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VOLUME 217 SEPTEMBER 23, 1937 NUMBER 13

COMMENTS UPON CERTAIN ASPECTS OF RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

LEWIS A. CONNER, M.D.*

NEW YORK CITY

IN venturing upon the discussion of a subject which at the present time is the basis of such intensive investigation as that of rheumatic fever, I do so only with considerable hesitation and with the implied understanding that I speak only from the standpoint of a clinician with a fairly long experience with the disease in both children and adults. The subject is of such vast clinical importance, however, that perhaps such discussion may be warranted, even though I may have little that is new to offer.

What I have to say will be limited to a consideration of four aspects of the disease: (1) the susceptibility to rheumatic fever; (2) the relative immunity of the heart valves to damage in adult life; (3) the extraordinarily benign character of uncomplicated rheumatic aortic insufficiency; and (4) the Flint murmur.

THE SUSCEPTIBILITY TO RHEUMATIC FEVER

The nature of the disease has, as you know, been the subject of a great amount of careful and painstaking investigation during recent years, and although many important facts have been added to our knowledge of it, its nature and cause still remain obscure and uncertain. Whether the disease has as its causal agent some one of the well-known bacteria, whether that unknown agent belongs to the class of filterable viruses, or whether the manifestations of the disease are the expression of some form of allergy, it is yet impossible to say.

As is so often the case in seeking for the cause of an infectious disease, a great deal of the labor of investigating it has been expended in disproving premature claims that the exciting cause has been discovered. At the present time the various members of the nonhemolytic group of streptococci seem to have lost much of their distinction as objects of suspicion and to have been displaced, apparently with better reason, by those of the hemolytic group.

Coburn[1] has recently emphasized anew the familiar fact that there are three well-defined phases in the development of an attack of rheumatic fever. The first is an acute upper respiratory infection, usually lasting but a few days; the second a latent or quiescent period, lasting from several days to several weeks; the third the period of active rheumatic manifestations. It has never been shown, I think, that individuals susceptible to rheumatic fever are more liable to upper respiratory infections, or to more severe types of such infections, than are those of the far larger class who never acquire the disease. Indeed, it is the everyday experience of all of us to see children with frequently repeated attacks of tonsillitis and nasopharyngitis go on year after year with such infections but with never a sign of rheumatic manifestations at any time. Nor is there any evidence that, in the small minority of individuals who acquire rheumatic fever, the bacterial flora found in the throat during the preliminary attack of tonsillitis or pharyngitis differs in any respect from that found in the throats of those individuals immune to rheumatic fever during similar attacks of throat infection.

In both groups the dominant organism present is the hemolytic streptococcus, and the strains found in both groups are said to be indistinguishable. What, then, is the nature of the immunity to rheumatic fever seen in most individuals and of the susceptibility manifested by the small minority?

One feature which has been receiving increasing attention since it was pointed out by Cheadle,[2] and later by St. Lawrence,[3] is the strong tendency of the disease to appear in several members of the same family. Does this represent some familial susceptibility, or is it merely the result of close contact and direct transmission, as has been suggested?

Henry Jackson Lecture, delivered before the New England Heart Association, April 30, 1937.

*Professor of clinical medicine, Cornell University Medical College.

Occasional small epidemics of rheumatic fever have been reported in which the factor of direct exposure seems to have been much more important than that of individual or familial susceptibility. On the other hand, a good many epidemics of upper respiratory infection by the hemolytic streptococcus are recorded in which no one of the affected individuals has acquired rheumatic fever. Yet as reported by Coburn and Pauli,[4] in the severe epidemic of *Streptococcus hemolyticus* throat infection that occurred in a convalescent home for rheumatic children, this was followed within a few weeks by a devastating outbreak of severe rheumatic manifestations. On the whole, then, it seems probable that the pronounced tendency of rheumatic fever to appear in more than one member of a family indicates some familial lack of natural protection against it.

Is this susceptibility to rheumatic fever similar in nature to that of such diseases as scarlet fever and diphtheria, in which there seems to be absence of natural protective forces, or is it of some other nature? There is one important difference, at least, between scarlet fever and rheumatic fever in that whereas a considerable degree of immunity is conferred by the former, no such immunity is seen after an attack of the latter. It is interesting to note, however, that this same difference exists between scarlet fever and erysipelas, both of which are apparently caused by the hemolytic streptococcus, for in erysipelas one attack seems rather to increase than to lessen the likelihood of others.

In the search for the causative agent of rheumatic fever, interest, as I have said, has shifted sharply from the nonhemolytic to the hemolytic group of streptococci, and a formidable amount of evidence is being assembled to indicate that hemolytic streptococcal infections of the throat are the usual, if not the regular, antecedents of the clinical manifestations of that disease. Whatever the actual cause of rheumatic fever may prove to be, it seems quite certain that the hemolytic streptococcus plays some important role in its production.

In a very recent publication of Coburn,[1] in which a study of the behavior of the hemolytic streptococcus antibodies following attacks of streptococcus pharyngitis is recorded, it is shown that when a rheumatic attack follows the attack of pharyngitis the behavior of these antibodies is very different from that when the throat inflammation is *not* followed by a rheumatic attack, whether it be a rheumatic or a nonrheumatic patient. When no rheumatic attack follows, the antibody response, as measured by the antistreptolysin titer, falls promptly upon convalescence from the inflammation and thereafter remains low. When, however, a rheumatic attack supervenes, the fall in titer is followed by a sharp rise at the time of the onset of the rheumatic manifestations, and, from this point on, the titer mounts steadily until after the rheumatic attack has begun to subside, and may continue very high for months if the rheumatic attack is protracted. From these findings, Coburn concludes that the immune responses to streptococcal infections of rheumatic patients differ from the normal in that they are *delayed*, and he suggests the hypothesis that the rheumatic state is characterized by an abnormal method of disposing of hemolytic streptococcus products. He admits, however, that the mechanism by which such an abnormal immune response may induce the disease is unknown.

Up to the present time the consensus (Swift,[5] Longcope[6]) seemed to be that the high antibody titers found in rheumatic fever were an indication of antecedent streptococcal infection, but could not be used as evidence that rheumatic fever itself was caused by the streptococcus. In the light of Coburn's recent work there seems to be some doubt as to whether such a conclusion was valid. At all events, that work seems to have added a new link to the chain of evidence which connects the hemolytic streptococcus with the pathogenesis of rheumatic fever.

THE RELATIVE IMMUNITY OF THE HEART VALVES TO DAMAGE IN ADULT LIFE

The variations in the manifestations of rheumatic fever as they appear at different periods of life have long been noticed, but seem to have been first clearly set forth in Cheadle's authoritative little book,[7] published in 1889. The frank, clean-cut arthritic attacks usually seen in adults are infrequent in children and are replaced by protracted or recurrent febrile periods, indistinct joint symptoms and cardiac manifestations of various sorts. To one who is familiar with rheumatic fever as it appears in adult life, one of the striking features of the disease is the infrequency with which such attacks are followed by evidence of valvular damage, as compared with the behavior of rheumatic fever in childhood and adolescence. This is true whether the rheumatic manifestations have appeared first in adult life or whether there have been earlier attacks without valvular involvement. Is there any satisfactory explanation for this relative immunity of the valves to rheumatic damage in adult life?

Ever since the embolic theory of valvular endocarditis was advanced by Koester[8] in 1878 the question as to the vascularity of the heart valves has been given much consideration, since obviously that theory required the existence of blood vessels in the valves. In spite of the great amount of study that has been devoted to this subject for more than half a century, the matter is still far

from settled and active controversy over it is still going on.

In 1921, Gross,[9] from a study of 100 human hearts, concluded, in agreement with the earlier findings of Langer,[10] that whereas in fetal life all the valves possess blood vessels, these vessels undergo regression before birth and usually disappear. In a small proportion of individuals, however, these blood vessels persist during childhood and at times even to adult life, and thus render the individual liable to embolic valvular endocarditis. These findings were supported by the later studies of Kugel and Gross,[11] and seemed to offer a reasonable explanation for the relative immunity of the valves in adults because of the tendency of the valvular blood vessels to disappear long before adult life is reached.

Unfortunately, however, the question of the vascularity of the valves is far from being settled. Gross,[12] in a very recent publication, has changed his views, and has reached the conclusion that vascularity even in normal-appearing heart valves is practically always the result of antecedent rheumatic inflammation, and that blood vessels do not exist in normal heart valves, except possibly as a great rarity. On the other hand, Wearn and Moritz[13] have recently reported the finding of blood vessels in 84 per cent of normal heart valves. Moreover, evidences of active or healed valvulitis were found in the absence of blood vessels, and the incidence of blood vessels in a given valve did not correspond to the incidence of rheumatic valvulitis in that valve. At the present time, therefore, it seems very unlikely that the immunity of the valves to rheumatic damage in the adult years is to be explained on the basis of variations in their vascular supply, and one seems forced to the conclusion that the difference in their reaction to rheumatic fever in childhood and in adult life is determined probably by the difference in the behavior of the rheumatic infection itself in the two age periods.

THE BENIGN CHARACTER OF RHEUMATIC AORTIC INSUFFICIENCY

The dramatic contrast between the prognosis of the luetic type of aortic insufficiency and that of the rheumatic form of aortic leakage has long been recognized and emphasized. That difference has, very properly, been ascribed to the fact that in the former disease the extension backward of the luetic process in the aorta to the sinuses of Valsalva and the aortic cusps, necessarily involves more or less serious encroachment upon the mouths of the coronary arteries. The gravity of the disease, then, lies in such interference with the coronary blood supply rather than in the mechanical damage to the aortic valve.

But even if one compares the clinical course of uncomplicated rheumatic aortic insufficiency with that of other rheumatic valve lesions, the benign character of the former is still conspicuous. This feature of the natural history of pure aortic insufficiency has long been recognized. Peter,[14] more than half a century ago, stated that "of all the valvular affections this one is the best borne," and testimony to the same fact has been offered by Strümpell,[15] Osler,[16] Vaquez[17] and various others. There would be no occasion for me to emphasize this point at the present time were it not for the fact that this characteristic seems to be much less generally recognized than it deserves to be.

For many years I have been much impressed by the number of men in middle life who have had "pure" aortic insufficiency since boyhood and who have nevertheless enjoyed perfect health, and have lived active, athletic lives during all the intervening time. We are so accustomed to regard marked enlargement of the heart as a sign of weakness that it is always a surprise to find, in such patients, a greatly enlarged left ventricle doing its work so satisfactorily over such a long term of years. Obviously in such cases damage must be confined to the valve structures, and the heart muscle must have escaped much more completely than is usually the case with other forms of rheumatic valvular disease.

It has been my experience that patients with uncomplicated rheumatic aortic insufficiency not only are able to live normally active lives, but usually live out the normal span of life and die ultimately of some other disease. This extremely benign course of aortic insufficiency must be responsible for the view apparently so generally held that rheumatic aortic insufficiency is comparatively rare and is less common than the luetic form. This view, I believe, is quite erroneous. Rheumatic aortic insufficiency is commoner than the luetic form, but is almost never seen in the hospital ward and is not apt to be seen even in the outpatient department. The subjects of it as a rule are in good health, have no symptoms, and have no occasion to seek medical aid. Almost the only danger to which such individuals seem to be exposed is that of subacute bacterial endocarditis; but that danger is a very real one, and it is a tragic experience to see persons in the prime of life, and apparently in the best of health, fall victims to this dread complication. Our knowledge of the exact mechanism of this infection is still most unsatisfactory, but because its danger is so real to the healthy subjects of aortic insufficiency, there seems to be a special reason in such cases for the most scrupulous attention to mouth and tooth hygiene.

THE FLINT MURMUR

In closing, I venture to say a few words upon a subject which I approach with considerable trepidation, for it is enveloped in an odor of sanctity formed of tradition and of its association with many distinguished names. I refer to the Flint murmur; and what I have to say will, I fear, sound heretical in view of all that has been written on the subject.

I had pursued the Flint murmur most assiduously for a great many years without ever having encountered what seemed to me a convincing example of that phenomenon when, one day seven or eight years ago, while making rounds in the New York Hospital, I came across a man of forty-three who seemed to be exactly the person for whom I had so long waited and searched. He had frank aortic insufficiency and had never had rheumatic fever, but had been treated for syphilis and had a strongly positive Wassermann reaction. The characteristic aortic diastolic murmur was clearly audible from the base almost to the apex, and at the apex itself there could be heard a typical rumbling, crescendo murmur which ended in a loud, sharp first sound.

Here, then, was a typical example of syphilitic aortic insufficiency. The patient's age, his luetic history, the absence of any earlier rheumatic attacks and the very recent development of his heart symptoms, all seemed to establish that diagnosis beyond any question. And yet he presented the unmistakable auscultatory signs of mitral stenosis. It seemed as though all the most rigid conditions that any captious critic could demand had been fully met, and the patient with his Flint murmur was displayed with pride to all and sundry. Eventually the poor man died with congestive failure and the autopsy revealed no trace of syphilitic aortitis, but instead an old rheumatic aortic insufficiency and a fairly advanced grade of mitral stenosis.

I do not for a moment mean to deny the existence of the Flint murmur; Flint's own report[18] of the two cases, with autopsy, that formed the basis of his publication is enough to establish it as an entity; but I cannot but feel that it must be extraordinarily rare. Certainly, so far as I know, I have never seen an example of it. Such a statement, which is so at variance both with published reports and with what seems to be the general experience, obviously calls for some explanation, and it seems altogether probable that this surprising difference in experience is to be explained by a difference in the understanding of the meaning of the term "Flint murmur" rather than by a difference in what has actually been heard.

If one goes back to Austin Flint's own description of the murmur, one will find that it is described as a "blubbering presystolic murmur" identical with that heard in mitral stenosis. Now, the characteristic features of the murmur of mitral stenosis, apart from its rumbling or blubbering quality, are that it is presystolic in time, increases in intensity and ends in the sharp first sound. Even when the murmur begins in the early part of the diastole, as it not infrequently does, it still retains its presystolic intensification and still runs into the first sound. This statement does not, of course, apply to cases of mitral stenosis with auricular fibrillation, but we are here concerned only with hearts having a sinus rhythm.

Now, if one looks over the protocols in the various writings upon this subject, one is struck by the frequency with which the murmur is described only as a "rumbling diastolic murmur" or as a "long diastolic murmur," without any intimation as to whether it had the essential presystolic component and presystolic intensification. In some instances, indeed, it is distinctly stated that the murmur had a diminishing character or that it ended before the first sound. This constitutes the crux of the whole matter. Can we, in the presence of aortic insufficiency and in hearts having a sinus rhythm, call an apical diastolic murmur, even though it be rumbling or blubbering in quality, the murmur of mitral stenosis unless it has a presystolic intensification and unless it merges with the following first sound? I myself do not think we can.

Much has been written on the diastolic murmur of aortic insufficiency and its propagation. It is well known, of course, that it is often heard much more distinctly in the third and fourth left intercostal spaces than over the aortic area. It is less generally known that it is sometimes heard much more distinctly at the apex or even well beyond the apex than it is over the base of the heart, or even in the third left space, although that fact has long been well established. It was pointed out by Foster[19] in 1874 and again in 1908 in an interesting paper by Cole and Cecil.[20]

In most such instances, however, the murmur preserves its high pitch and its smooth, blowing character, and there is little difficulty in identifying it as the propagated murmur of aortic insufficiency. There are occasionally, however, cases in which this apical aortic diastolic murmur loses some of its characteristic pitch and quality and becomes lower pitched and less smooth and blowing, and yet, by careful timing, one can readily convince oneself that it is still the propagated aortic murmur. Just why this change in character should occur I do not know, but it seems to me reasonable to assume that in these occasional cases the modification may be due to some unusual vibra-

tion of the mitral curtain between the two streams of blood entering the left ventricle. The point to be emphasized, however, is that the murmur, even though changed in quality, is still one which has all the time-relations of the aortic murmur, and that it never has the presystolic, crescendo character and never unites with the first sound. In other words, it does not have the characteristics of the murmur of mitral stenosis.

I believe, therefore, that the difference of opinion that exists as to the frequency or the rarity of the Flint murmur is to be explained by the fact that the aortic diastolic murmur, when heard distinctly at the apex and when modified in its quality,—as undoubtedly it sometimes is,—is often called the Flint murmur in spite of the fact that it lacks the essential features of that murmur as described by Flint.

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AN ANALYSIS OF THE 1935 EPIDEMIC OF INFANTILE PARALYSIS IN MASSACHUSETTS

ARTHUR T. LEGG, M.D.†

BOSTON

IN 1935 Massachusetts suffered an epidemic of infantile paralysis similar to those of 1916, 1927 and 1931. The following summary is an analysis of this epidemic as found by the Harvard Infantile Paralysis Commission Clinic, and serves as a basis of comparison with other epidemics.

The total number of cases reported in the state was 1,392. This figure ranks third in severity in relation to previous epidemics.

1916	1,927 cases reported
1927	1,189 cases reported*
1931	1,429 cases reported
1935	1,392 cases reported

Of the 1935 cases the Harvard Commission Clinic at the Children's Hospital saw 28.4 per cent (397 cases) by January 1, 1936, and 33.1 per cent (462 cases) by May 22, 1936. There were 5 out-of-state cases.

DISTRIBUTION

Geographic Distribution. The eastern part of the state was most severely affected, with Boston and vicinity reporting 545 cases, Fall River 112, Lowell 38 and Haverhill 36. The occurrence rate of Boston was 0.55 per 1,000, of Fall River 0.97, of Lowell 0.38 and of Haverhill 0.74. The 1927 analysis showed a similar concentration of cases in the eastern part of the state, but the occurrence rates were somewhat different, that of Boston being 0.35 per 1,000 and that of Haverhill 2.00.

Seasonal Distribution. As in former years, the greatest number of cases occurred in the late summer and early fall, with 482 cases in August and 537 in September, dropping to 235 in October and to 58 in November (Fig. 1). In comparison with 1927 the height of this epidemic was a month earlier, the two severe months in 1927 being September and October.

Age and Sex Distribution. The ages of the state cases and the ages and sex of the Commission cases are given in Tables 1 and 2, respectively. The latter are represented graphically in Figure 2.

The average age of the cases in the State was 8.6 years, while the average age for the Commission cases was 6.9 years for the males and 7.3 years

*All figures of the 1927 epidemic given in this report have been taken from An Analysis of the 1927 Epidemic of Infantile Paralysis in Massachusetts, by Arthur T. Legg, M.D. J. A. M. A. 92:31 (Jan. 5) 1929.

†Assistant professor of orthopedic surgery, Harvard Medical School.

for the females. In 1927 the average age in the State was 7 years and in the Commission cases 5.4 years. The majority of the latter were between the ages of two and six years; the males predominated in each year with the exception of the fifth and eighth. This male predominance was

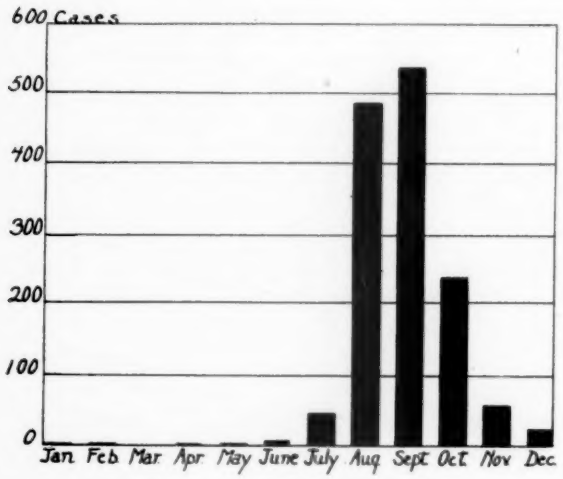

FIG. 1. Seasonal onset distribution—1935—1,392 cases.

TABLE 1. *Age of Total Massachusetts Cases of Infantile Paralysis in 1935.*

Age	*Number* *
Under 1	23
1	68
2	108
3	126
4	123
5	88
6	93
7	116
8	86
9	74
10-14	298
15-19	98
20-24	42
25-29	20
30-34	11
35-44	10
45-54	0
55-64	1
65-74	1
Unknown	6
Total	1,392

*State House Report.

true in 1927 also, where the males were more numerous in all years but the fourth and fifth.

Familial Incidence. In 46 instances, or 9.8 per cent of the total Commission cases, familial incidence occurred. In each of two families 3 cases were found and in each of three families 5 cases. The number of cases with members of the family who had an attack some previous year was not accurate, but it was noted as occurring in a surprising number. In 1927, familial incidence occurred in 4.2 per cent of the cases, one family having 4 children affected.

INVOLVEMENT

In the following figures only the cases seen at the Harvard Commission Clinic have been used. The 1935 cases seen by January 1, 1936, and numbering 401 (of which 4 had incomplete examinations and were discarded) have been taken. We

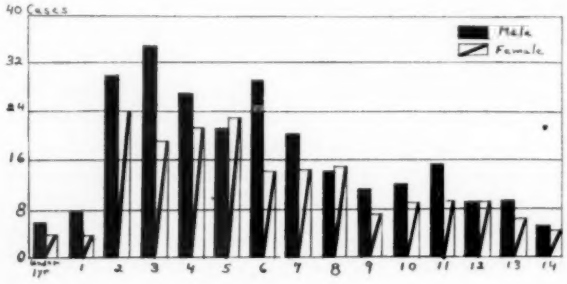

FIG. 2. Age and sex distribution—1935—432 cases.

felt that to use cases coming in after that date would not be correct, inasmuch as so much of their spontaneous recovery would have taken place that it would make the initial average involvement figures inaccurate. In tables where the specific extent of involvement was unnecessary, but only the presence of involvement was required, cases were used including those seen after January 1, 1936. These totaled 467.

The average time the cases were seen after onset was thirty-two days, an average interval shorter than that of any previous epidemic. In 1927 the average interval was six weeks.

Sensitiveness. The average duration of sensitiveness was not determinable, as the families were very uncertain as to its limits. In 1927, 68.7 per cent of the total number of cases showed sensitiveness present at the initial examination, and that figure was considered conservative. The following figures for 1935 are but general, rough averages, as we feel that sensitiveness was present at a much higher rate than shown:

Total cases	38.9	per cent
Arm cases	5.0	" "
Leg cases	26.4	" "
Arm and leg cases	7.5	" "

General Involvement. At their first examination 9.5 per cent of the patients were normal, 39.2 per cent had arm paralysis, 79.9 per cent had leg paralysis, and 72.4 per cent had trunk paralysis.

The distribution of paralysis of the arms and legs combined with other involvement of the abdomen, back, neck and face may be seen in Table 3.

Cases with involvement of abdomen only, numbered 2, of face only, 4, and of neck only, 4. There was involvement of the palate in 29 cases.

Severity of Involvement. The method of measuring muscle power that has been used since the beginning of the Harvard Infantile Paralysis Commission Clinic in 1916 is as follows:

Normal: a muscle that can carry out its normal test = 0.

Good: a muscle that can overcome gravity and some resistance but not so much as normal test = 1.

Fair: a muscle that can overcome gravity but not resistance = 2.

Poor: a muscle that can carry out its action when gravity is eliminated = 3.

Trace: a muscle that can be felt to contract but in which no movement of part can be accomplished = 4.

Gone: a muscle in which no contraction can be felt = 5.

By this table the averages of the extent of paralysis were made.

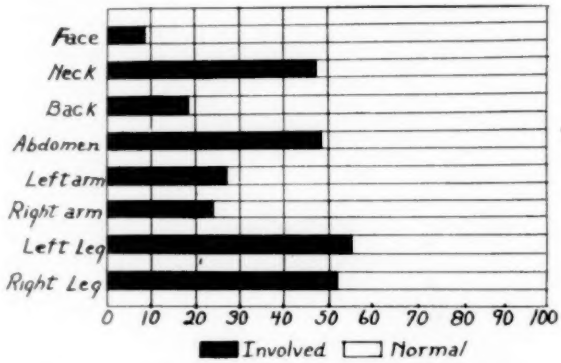

FIG. 3. Per cent involvement in parts of the body—401 cases.

The average severity of paralysis of cases with arm involvement was 13.3 per cent, with leg involvement 17.8 per cent and with trunk involvement 17.2 per cent. As for comparison of involvement of the left and right sides, Figure 3 shows

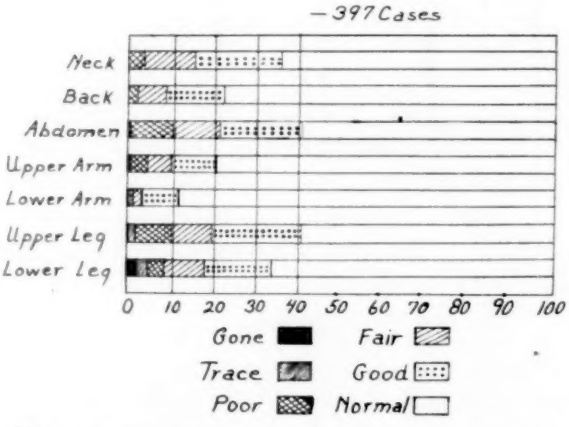

FIG. 4. Per cent muscular involvement with each grade of paralysis—397 cases.

that the left side was slightly more paralyzed than the right in 1935, whereas in 1927 there was no difference.

Figure 4 and Table 4 show the specific percentage of each grade of paralysis of the different parts of the body. Here it is interesting to note that the abdomen and upper leg had more general involvement than other parts, as was true in 1927. The lower legs, having less general involvement, had more serious localized involvement, as was also true in 1927.

TABLE 2. *Age and Sex of Harvard Commission Clinic Cases of Infantile Paralysis in 1935.*

Age	*Number*		
	Male	*Female*	*Total*
Under 1	6	4	10
1	8	4	12
2	30	24	54
3	35	19	54
4	27	21	48
5	21	23	44
6	29	14	43
7	20	14	34
8	14	15	29
9	11	7	18
10	12	9	21
11	15	9	24
12	9	9	18
13	9	6	15
14	5	4	9
15	7	3	10
16	2	4	6
17	1	0	1
18	2	2	4
19	1	0	1
20	1	1	2
22	0	1	1
24	1	1	2
25	0	1	1
27	0	1	1
30	0	1	1
32	1	0	1
34	1	0	1
35	1	0	1
45	0	1	1
		Total	467

There has been some question as to the ratio of involvement and age. Figure 5 indicates that

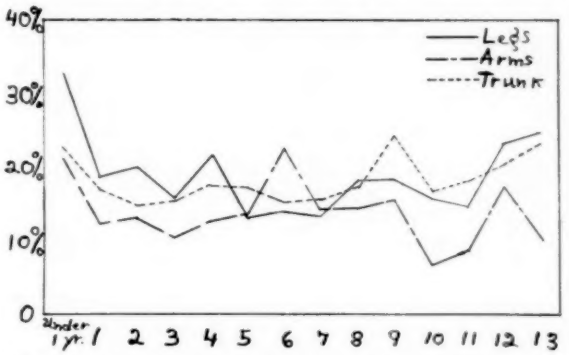

FIG. 5. Age and average per cent severity of involvement—1935—373 cases.

the severity of the paralysis had no relation to the age of the individual. Cases over thirteen years of age were not included because of lack of sufficient cases in each age group to make a true average.

Comparison of Order of Severity and Order of Frequency of Involvement. Tables 5 and 6 show the order of frequency of involvement and the order of severity of involvement. Severity includes Grade 4 ("trace") and Grade 5 ("gone"). From these tables one sees that the deltoids were the most often affected, as was true in 1927 and in the years between 1916 and 1924. This was true also of severity, with the exception of the anterior deltoid, which in 1935 was fifth in order.

Other than these muscles no comparison is possible, as there was considerable variance in the severity and frequency of involvement with previous years, although in general the muscles of the upper arm were more seriously and more often affected than those of the lower arm in both 1935 and 1927. In both 1935 and 1927 it is quite noticeable in the comparison of leg involvement that in severity the anterior tibial, the posterior tibial and the peroneals ranked first, second and third, respectively, whereas in frequency the quadriceps ranked third and the hip abductors fourth. In both years the upper leg was frequently involved and the lower leg more seriously involved.

TABLE 3. *Distribution of Paralysis and Involvement of Abdomen, Back, Neck and Face.*

Distribution of Paralysis in Arms and Legs	Cases		Stated Distribution of Other Paralyses			
			Abdomen	*Back*	*Neck*	*Face*
	no.	*%*	*%*	*%*	*%*	*%*
No arm or leg	72	15	17	1	21	14
Both legs	130	28	76	24	63	5
One leg	80	17	43	8	43	8
Both legs, one arm	27	6	74	26	63	11
Both arms	15	3	33	7	67	7
One arm	19	4	21	0	47	0
Both arms, one leg	11	2	55	27	55	9
One arm, one leg	17	4	47	0	41	0
Both arms, both legs	96	21	94	65	89	17
Total	467					

TABLE 4. *Percentage of Muscular Involvement with Each Grade of Paralysis 397 Cases.*

Part of Body	Normal	Good	Fair	Poor	Trace	Gone
Neck	63.1	21.4	11.0	4.0	0.0	0.0
Back	77.3	13.9	6.2	2.5	0.0	0.0
Abdomen	59.4	18.8	11.5	9.3	0.5	0.0
Upper arm	80.1	10.9	5.2	3.3	0.4	0.4
Lower arm	88.6	8.0	2.0	0.6	0.3	0.7
Upper leg	58.8	21.8	9.5	7.6	1.8	0.2
Lower leg	66.4	16.4	8.3	4.1	2.1	2.5

TABLE 5. *Order of Frequency of Severe Paralysis and of Involvement of Muscles of the Arm.*

Muscle	Frequency of Severe Paralysis*		Frequency of Involvement	
	Order	*Per Cent*	*Order*	*Per Cent*
Posterior deltoid	1	1.9	1	25.6
Dorsal interossei	2	1.3	17	11.9
Abductor minimi digiti	3	1.3	25	9.8
Opponens pollicis	4	1.1	24	10.4
Anterior deltoid	5	1.1	2	24.8
Lumbricales	6	1.0	26	9.5
Thumb flexors	7	1.0	27	9.0
Palmar interossei	8	1.0	22	11.1
Finger extensors	9	1.0	21	11.2
Latissimus dorsi	10	0.9	5	21.8
Clavicular pectoralis major	11	0.9	10	18.6
Biceps	12	0.9	13	16.3
Flexor carpi radialis	13	0.9	15	12.7
Abductor pollicis	14	0.9	16	12.2
Flexor carpi ulnaris	15	0.9	18	11.8
Thumb extensors	16	0.9	19	11.6
Extensor carpi ulnaris	17	0.9	20	11.4
Extensor carpi radialis	18	0.9	23	11.1
Flexor profundus digitorum	19	0.9	29	8.8
Flexor sublimis digitorum	20	0.9	30	8.8
Outward rotators	21	0.8	11	17.1
Pronators	22	0.8	14	15.7
Supinator brevis	23	0.6	12	16.9
Sternal pectoralis major	24	0.6	9	18.9
Triceps	25	0.6	8	19.9
Lower trapezius	26	0.5	3	24.1
Middle trapezius	27	0.4	4	23.2
Rhomboids	28	0.4	6	20.4
Serratus magnus	29	0.4	7	19.9
Upper trapezius	30	0.0	28	8.9

*Includes Grades 4 and 5 ("trace" and "gone").

Total Severity. By using the numerical grades of paralysis and summing all the figures represent-

TABLE 6. *Order of Frequency of Severe Paralysis and of Involvement of Muscles of the Leg and Trunk.*

Muscle	Frequency of Severe Paralysis*		Frequency of Involvement	
	Order	*Per Cent*	*Order*	*Per Cent*
Anterior tibial	1	7.5	14	36.8
Posterior tibial	2	7.0	15	36.2
Peroneals	3	5.3	23	26.1
Extensor longus digitorum	4	4.9	18	32.4
Extensor proprius hallucis	5	4.6	19	31.4
Gastrocnemius	6	3.5	5	48.1
Flexor longus hallucis	7	3.2	20	30.9
Outer hamstrings	8	3.1	12	37.9
Flexor longus digitorum	9	3.0	21	30.3
Inner hamstrings	10	3.0	13	37.4
Hip adductors	11	3.0	10	40.2
Short toe flexors	12	2.3	22	30.3
Inward rotators	13	2.0	16	35.2
Tensor fasciae latae	14	2.0	6	43.7
Hip abductors	15	2.0	4	49.2
Quadriceps	16	1.6	3	51.8
Hip flexors	17	1.1	9	40.2
Outward rotators	18	1.0	17	34.5
Anterior abdominals	19	0.8	1	58.6
Lateral abdominals	20	0.8	7	43.1
Sartorius	21	0.8	11	38.4
Gluteus maximus	22	0.6	8	43.0
Anterior neck	23	0.0	2	57.4
Back	24	0.0	24	22.7
Quadratus lumborum	25	0.0	25	19.7
Posterior neck	26	0.0	26	15.9

*Includes Grades 4 and 5 ("trace" and "gone").

ing the muscles that are involved, one can arrive at a fair representation of the average severity of the epidemic. In Figure 6 it is seen that 1935 was noticeably lighter in paralysis than were the preceding years. In studying the analysis closely, however, one sees that frequency and severity of involvement follow in a pattern similar to that of the previous epidemics.

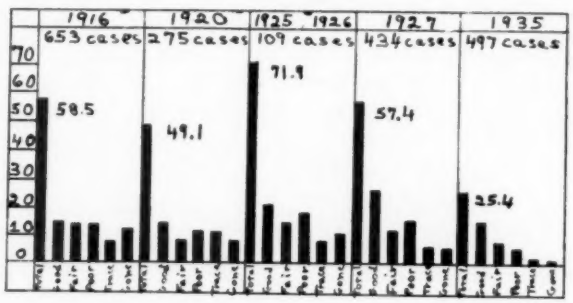

FIG. 6. Average extent and severity of paralysis.

FATALITY RATE

The fatality rate of the state was 4.4 per cent, and was much lower than that in other years:

1916	23.5 per cent
1920	20.7 " "
1927	14.2 " "
1935	4.4 " "

This sudden drop in the rate can be partly explained by the early diagnosis allowing immediate care, by the use of the respirator and by the larger number of cases diagnosed as poliomyelitis which formerly would not have been considered as such. Another important fact, already mentioned, is that

the disease in this epidemic was not nearly so extensive as the previous ones (Fig. 6).

SUMMARY

A study of the 1935 epidemic of infantile paralysis in Massachusetts is presented.

Geographically, the distribution was greatest in the eastern part of the state.

Seasonally, the peak was reached in August and September.

The lower legs were more affected than the abdomen and upper legs from the point of view of severity of involvement.

The severity of paralysis appeared to have no relation to the age of the individual.

Both the frequency and severity of involvement corresponded in the main with the epidemic of 1927.

The severity and extent of paralysis when compared with that of other years was less in 1935.

CEREBRAL FAT EMBOLISM

Report of a Case

Arthur J. D'Elia, M.D.,* and Maurice R. Moore, M.D.†

Norwich, Connecticut

THE following case was considered worth reporting because of the interesting clinical and pathological findings.

CASE REPORT

On February 19, 1936, the patient, a white 26-year-old housewife, fell on a slippery sidewalk and fractured her right leg. There was no head injury, and she was not unconscious. An improvised splint was immediately applied by a layman, and she was taken to the Backus Hospital in Norwich, Connecticut. A simple comminuted fracture of both the right tibia and fibula at the junction of the middle and lower thirds of the leg was found. On February 21, the fracture was reduced under avertin anesthesia, and a plaster spica was applied from the base of the toes to the upper part of the thigh. On February 25, six days following the fracture, the patient became mentally upset. She thought she was going to die. On the 27th it was reported that she was nervously upset and weak, and felt numb all over her body. On February 29 she complained that she could not breathe, and on March 1 she displayed a marked mental depression. On March 3 she was discharged home, where she was confused, disoriented, irrational, noisy and uneo-operative, and refused food and medication. She was returned to the hospital on March 5. There the patient appeared confused and complained that her blood did not circulate. She was depressed, cried easily, and was unco-operative to physical examination. Because she refused to eat, she received numerous clyses of 5 per cent glucose.

Physical examination was essentially negative. Urinalysis was negative. The white blood count was slightly elevated. From February 19 to March 16 the patient ran a temperature between 99 and 101° F. (oral) and on March 16 the temperature was 102° F. Her pulse rate varied between 70 and 120.

While at the hospital the patient expressed many peculiar ideas stating that her food was not digestible, that her leg had been broken again and that all the bones in her body had been fractured. She told her husband that she was going to die and would never leave the hospital alive and that she wanted to be buried near her mother. She also stated that her blood had coagulated and that she had no "feelings." One night she thought she saw a fire and a coffin near her bed and her deceased mother standing near by. She believed that the nurses were attempting to kill her by poisoning her food and water, and when she became incontinent of urine, she stated that this was due to the poison that the nurse had injected into her body. She became so noisy and unco-operative that it was decided to transfer her to the Norwich State Hospital, where she was admitted March 16.

On her admission to this hospital the patient was restless, talkative and constantly complaining. It was impossible to obtain any coherent information from her because she seemed so preoccupied with her own thoughts. She seemed very confused and perplexed and at times was quite tearful, especially when her relatives visited her. At no time did she volunteer any information about herself. After the first few days she did not recognize her relatives and showed no response when they visited her. She became untidy in her habits, was resistive, had to be spoon-fed, was aggressive toward the nurses, and screamed quite loudly at times. On a few occasions the patient became apprehensive and cyanotic. Her physical condition gradually became poorer, and she weakened so that she was unable to respond to simple commands. Finally she became incontinent both as to urine and feces.

The family history revealed that her father and two brothers were alcoholics and that a maternal cousin had been confined to this hospital with a diagnosis of dementia praecox. Her past history was essentially negative. Up to the time of her illness the patient had been considered perfectly well both physically and mentally. On physical examination there were no external signs of injuries to the head. Her pupils were small, but regular in outline and reacted sluggishly to light and accommodation. A plaster cast was present on her right leg, extending from the toes to the upper part of the thigh. The blood pressure was 116/90; the heart was not enlarged and the sounds were of good quality and regular. There were no murmurs; the rhythm was regular, but the rate was 120 per minute. The lungs were negative.

On March 26 urinalysis revealed a moderate amount of albumin and a few red blood cells. On March 29 there were a marked amount of albumin and urobilinogen in the urine and a few hyaline and granular casts. Blood Wassermann and Kahn reactions were negative. Her temperature ranged between 101 and 102° F. (rectal); pulse rate between 90 and 120.

From the Norwich State Hospital.

*Assistant physician, Norwich State Hospital.

†Pathologist at the Norwich State Hospital.

On March 27 the patient had a rectal temperature of 102° F.; on March 30 it rose to 104.2° F. There was an increased respiratory rate; rales were present in both the upper and lower lobes of the right lung and a diagnosis of bronchopneumonia was made. Laboratory findings at this time revealed a white blood cell count of 25,200, 87 per cent polymorphonuclear leukocytes. Blood chemistry showed a blood urea of 128 mg. per cent and a urea nitrogen of 66 mg. The patient died on March 30.

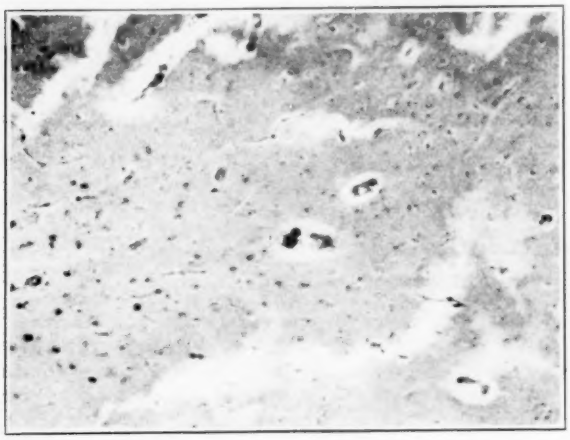

FIG. 1. A section of cerebral cortex with fat emboli in a capillary. Osmic acid stain. ×100.

A complete autopsy examination 6 hours after death revealed: bilateral cerebral edema and compression involving the temporal, parietal and occipital lobes; lobular pneumonia; a small patency of the foramen ovale with no increase in size of the heart; and a healing fracture of the right tibia and fibula. Fat stains demonstrated multiple fat emboli in the capillaries of the brain, lungs, liver and kidneys (Figs. 1 and 2).

Groskloss,* in a recent review of fat embolism, reported that the greatest incidence of either pulmonary or cerebral types of fat embolism follows fractures of the femur, knee joints, forearm and metatarsal bones. The mortality is believed to be approximately 85 per cent, and many patients die without being correctly diagnosed. However, cases of recovery from the cerebral form have been reported in the literature. The pathology of fat embolism is well known and thoroughly discussed both in the literature and surgical textbooks.

Groskloss found that the following sequence is of the utmost diagnostic significance: (1) trauma, (2) free interval of three to six days before the onset of any symptoms, (3) rise in body temperature, (4) mild delirium and stupor, passing into coma, (5) increased pulse and respiration rates,

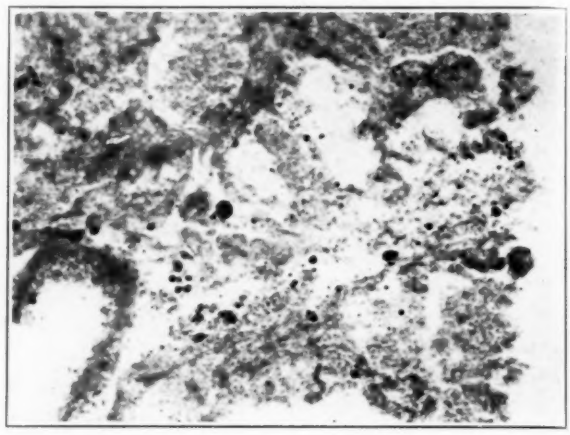

FIG. 2. A section of lung with multiple fat emboli. Osmic acid stain. ×100.

(6) fat in the sputum and urine. In dealing with fractures he believes that the most important essentials are early adjustment and absolute rest.

The interesting clinical findings in this case were: fracture of two medullated bones; considerable manipulation by a layman before professional aid was employed; typical "free period" of six days; accelerated respiration and pulse rates; increase of temperature; marked cerebral symptoms; death forty days after the fracture, of bronchopneumonia. Histologic examination showed fat emboli in the brain, lungs, liver and kidneys; the small patency in the foramen ovale was of doubtful significance.

We are indebted to H. E. MacMahon, M.D., Boston, Massachusetts, for his helpful suggestions, and to Jean Kieffer, Norwich, Connecticut, for the photomicrographs.

*Groskloss, Howard H.: Fat embolism. Yale J. Biol. & Med. 8:59 (Oct.) 1935; 8:175 (Dec.) 1935; 8:296 (Jan.) 1936.

VERMONT STATE MEDICAL SOCIETY

THE ONE HUNDRED AND TWENTY-FOURTH ANNUAL MEETING

THE one hundred and twenty-fourth annual meeting of the Vermont State Medical Society will be held in St. Johnsbury on October 13, 14 and 15. The House of Delegates will meet in the Antique Room of the St. Johnsbury House on October 13 at 8 p. m. and on October 14 at 1 p. m. The scientific sessions will be held in the main auditorium of the Vermont State Armory on October 14 at 9:30 a. m. and 2 p. m. and on October 15 at 9 a. m. The annual banquet will be held in the main dining room of the St. Johnsbury House on October 14 at 7 p. m., with Dr. Frank E. Farmer of St. Johnsbury presiding at the postprandial exercises. The local committee of arrangements, consisting of Dr. W. B. Fitch, chairman, and Drs. E. M. Cleasby, D. E. Coburn, E. A. Cramton and R. H. Burke, have arranged a luncheon for physicians and their guests on Thursday, October 14, at the Colonial Restaurant. The ladies committee, consisting of Mrs. E. A. Cramton, chairman, and Mrs. D. E. Coburn, Mrs. D. E. Sheffield, Mrs. R. K. Ransom and Mrs. A. G. Franceschi, will serve a complimentary luncheon to visiting ladies and wives of local physicians at the Maple Grove Inn on Eastern Avenue at 1 p. m. on the same day. Following this luncheon, bridge and golf are available for those who wish to play either. The local headquarters of the society and the registration desk will be in the State Armory. In addition to a number of scientific exhibits, there will be a large display by commercial exhibitors in the Exhibit Hall in the State Armory.

The following is the program for the scientific sessions:

THURSDAY FORENOON, OCTOBER 14, 9:30 A. M.

Main Auditorium, State Armory

Call to order by the President, W. G. Ricker, M.D., St. Johnsbury, Vt.

Invocation. Rev. Stanley P. Jones, rector of St. Andrew's Episcopal Church, St. Johnsbury, Vt.

Address of Welcome. Mr. C. R. Sumner, town manager, St. Johnsbury, Vt.

Reports of the officers and committees.

Reception of delegates from other societies.

Vice-President's Address—Cerebral Arteriosclerosis.
Waldo J. Upton, M.D., Burlington, Vt.

Agranulocytic Angina.
Christopher C. Shaw, M.D., Bellows Falls, Vt.

Clinical Experiences with Nondiabetic Use of Three Unit Doses of Insulin.
D. C. Jarvis, M.D., Barre, Vt.

Announcements.

Early Diagnosis of Cancer of the Cervix Uteri.
Walter Schiller, M.D., Vienna, Austria, director of laboratories at the New York Jewish Memorial Hospital.

THURSDAY AFTERNOON, OCTOBER 14, AT 2:30 P. M.

Main Auditorium, State Armory

President's Address—Modern Ideas in Diagnosis and Treatment as Exemplified by Hippocrates.
W. G. Ricker, M.D., St. Johnsbury, Vt.

A Challenge to Medicine.
R. J. Leland, M.D., Chicago, Ill., director of the Department of Medical Economics of the American Medical Association.

Some Practical Points in the Diagnosis of Asthma and Hay Fever.
F. M. Rackemann, M.D., Boston, Mass., associate in medicine, Harvard Medical School.

Announcements.

THURSDAY AFTERNOON, OCTOBER 14, 4:30 P. M.

The Star Theatre, St. Johnsbury, Vt.

Motion Picture—Syphilis, a sound film produced under the direction of the American Medical Association and the United States Public Health Service. The discussion following the showing of the film will be led by Dr. F. S. Kent of the Laboratory of Hygiene of the Vermont State Board of Health.

FRIDAY FORENOON, OCTOBER 15, 9:00 A. M.

Main Auditorium, State Armory

Report of the House of Delegates.

Symposium on Practical Surgery for the General Practitioner.
By members of the faculty of Temple University, Philadelphia, Pennsylvania, arranged by W. Wayne Babcock, M.D., professor of surgery.

The General Practitioner's Surgery.
W. Wayne Babcock, M.D.

The General Practitioner Diagnoses and Relieves Pain by Surgical Methods.
William A. Steel, M.D., professor of general surgery.

The General Practitioner's Thoracic Surgery.
W. Emery Burnett, M.D., clinical professor of surgery.

The General Practitioner's Orthopedics and Fracture Management.
John Royal Moore, M.D., professor of orthopedics.

The General Practitioner's Roentgenology.
W. Edward Chamberlain, M.D., professor of roentgenology.

RECENT DEATHS

JENNE—James Nathaniel Jenne, M.D., seventy-seven years old, dean of the College of Medicine, University of Vermont, for the last eleven years, died at his home, 260 Main Street, Burlington, Vermont, September 9, following a brief illness.

Born in Berkshire, December 21, 1859, the son of John Gilbert and Charlotte T. (Woodworth) Jenne, Dr. Jenne was educated in the Berkshire public schools and Enosburg Falls High School. Graduating from the University of Vermont College of Medicine in 1881, he took a course at the New York Post Graduate School and Hospital, and then pursued medical studies in Europe. He studied at the École de Médecine in Paris, completing his course in 1896.

Dr. Jenne began the practice of medicine and surgery in Georgia in 1881, remaining in that town until 1887 when he moved to St. Albans, establishing a private practice there.

Coming to Burlington in 1903, Dean Jenne continued his practice until his death. From 1887 to 1897 he served as chief surgeon of the Central Vermont Railway. From 1891 to 1893 he was adjunct professor of materia medica at the College of Medicine, University of Vermont. From 1894 to 1889 he was professor of the same subject; from 1900 to 1931 he was professor of therapeutics and clinical medicine, and from 1926 until his death was dean of the College of Medicine. He was elected a member of the board of trustees of the University in 1923 and served until he became dean.

Dean Jenne was a member of the board of consulting surgeons of the St. Albans Hospital from 1886 to 1903, of the Mary Fletcher Hospital from 1890 to 1904, when he was elected attending physician. Director of the University of Vermont College of Medicine dispensary, he also was consulting surgeon at the Bishop DeGoesbriand and Fanny Allen hospitals.

Surgeon general of the State of Vermont under Governors U. A. Woodbury and Josiah Grout, Dean Jenne first served as assistant surgeon and then surgeon of the First Regiment and also surgeon of the First Brigade, Vermont National Guard, for ten years.

After the United States declared war against Spain in 1898, Dean Jenne was appointed by President McKinley as chief surgeon in the United States Army with the rank of major of volunteers serving for one year on the staffs of Generals C. C. Compton, James F. Wade and Joseph C. Breckenridge. He was stationed with the first and third army corps at Chickamauga Park and at Fortress Monroe, Va., being attached to the Josiah Simpson General Hospital in the latter place.

His memberships included the American Medical Association, the Vermont State Medical Society of which he was ex-president, the Chittenden County Medical Society, of which he also was an ex-president, the Chittenden County Clinical Society, the Clinical Society of New York, and the Nu Sigma Nu fraternity.

On September 19, 1883, Dean Jenne married Abbie Cushman of Georgia. She died May 17, 1928.

One sister, Mrs. L. L. Marsh of Enosburg Falls; one niece, Mrs. Charlotte Batchelder of Hampton, N. H., and two nephews, John T. Jenne and James K. Jenne of Richford, survive him. A brother, Dr. Charles S. Jenne, died in 1901.—*Burlington Free Press.*

WORTHEN — Charles Wesley Worthen, M.D., of White River Junction, Vermont, died August 23. He was in his seventieth year.

Dr. Worthen graduated in 1893 from the University of Vermont College of Medicine after which he attended the Hahnemann Medical College and Hospital in 1894.

He was a member of the Vermont State Medical Society.

NUTRITION, HEALTH AND DISEASE

FRANCIS LOWELL BURNETT, M.D.*

BOSTON

"THE newer knowledge of nutrition is the greatest advance in medical science since the days of Lister; . . . it will do for medicine what asepsis has done for surgery." The prediction was reiterated by McCarrison (*Brit. M. J.*, 2:611 [Sept. 26] 1936) in the inaugural address of the Section of Nutrition at the annual meeting of the British Medical Association in 1936. The opening of the section was a memorable event, and was made still more notable by the address on "Nutrition in Health and Disease," as the following pertinent passages prove:

"Although young in years, the newer knowledge of nutrition . . . embraces in its compass every branch of medicine. . . . Medicine is, in short, the science and art of maintaining health. And what is nutrition? It is a fundamental function on which the condition of the body—health—depends. It is not merely food or that which nourishes. . . . Food is the instrument of nourishment; nutrition is the act of using it—the series of coordinated processes whereby the nourishment of the body is effected. It consists of the taking in and assimilation through chemical changes—metabolism—of materials with which the tissues of the body are built up, their waste repaired, and their deterioration prevented; by which the processes of the body are regulated and co-ordinated, from which energy is liberated for the internal and external work of the body, and from which heat is generated for the maintenance of its temperature. A primary purpose of the function of nutrition is, thus, to establish and to sustain the structure and function of all organs and parts of the body; to keep, in short, the mechanism of the body in perfect running order. And since health, at its best—for it is a variable state of being—is that condition of body in which all its organs are sound and perform their functions duly, easily, and satisfactorily, it follows that a primary purpose of the function of nutrition is to prevent, so far as its limitations permit, that disturbance or impairment of structure or function of organs or of the parts of the body which is disease.

"Nutrition . . . depends on a number of factors: the constitution of the food, the adequate oxygenation of the blood and tissues, the efficiency of the processes—digestion, absorption, assimilation, circulation, excretion—involved in this function, proper exercise of the body, rest and sleep, freedom from worry and emotional excitement, general hygiene, sunlight, and inherited characters. . . . Food is thus the greatest of all factors on which the efficiency of the function of nutrition depends. It is the foundation of health; chief amongst the armaments of medicine against disease. . . . What are the materials wherewith the function of nutrition is effected and whence are they derived? They are . . . oxygen, water and the digestion products of protein, fats, carbohydrates, mineral elements, and vitamins. . . . We are on surer ground when we consider the foodstuffs which, when properly combined in the diet, are known to ensure perfect nutrition and a high grade of physical efficiency and health in human beings. These foodstuffs are: (1) a good whole-cereal grain or mixture of whole-cereal grains or a good whole-meal bread; (2) milk and the products of milk—butter, cheese, curds, buttermilk; (3) eggs; (4) green-leaf vegetables; (5) root vegetables—potatoes, carrots, and so forth; (6) legumes; (7) fruit; (8) meat; and (9) water. . . . If food be the foundation of health, these foodstuffs are its foundation stones. Using them aright, there is little need to concern ourselves too closely with the precise amounts of this or that chemical ingredient of food that may be necessary for normal nutrition. . . .

"The health of the gastrointestinal tract depends on the adequate provision in the diet of water, proteins, mineral elements, and vitamins. . . . Proteins and their contained aminoacids are the sources from which hydrolytic enzymes concerned in digestion are derived, and from which the catalytic agents . . . are elaborated. . . . Mineral elements . . . enter into the composition of all cells, . . . they control the permeability of cell membranes, the normal contractility of muscle, the excitability of nerves, . . . and some enter into the composition of the digestive juices. . . . Vitamins of the A, B, and C classes have all a profound relation to the structural and functional efficiency of the alimentary tract. . . . Food deficiencies . . . derange both the normal production of hormones and the functional perfection of sympathetic control . . . . Especially do I direct attention to the effects of food deficiency on the digestive organs and on those endocrine organs concerned in the regulation of the metabolic processes. These effects provide the pathological basis for attaching to food deficiencies a prominent etiologic significance in regard to that great mass of ill-defined gastrointestinal disorders and vague ill health which throngs clinics, . . . and concerning which we have

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hitherto known little or nothing. . . . To biochemistry has fallen the task of isolating the vitamins: a task it is fulfilling with conspicuous success. There is, however, the risk that in the maze of vitamin and biochemical literature the practitioner of medicine may lose sight of the simple fact that all the body needs for perfect nutrition is provided in the relatively few foodstuffs already mentioned, if these be consumed in proper quantity and in the form in which nature provides them. Then the questions as to what vitamins, what minerals, what other substances, and how much of them are needed by the body are answered for him, and more certainly than by biochemistry. . . . It is the insufficiency, the inadequate ingestion, absorption, or utilization of the vitamins rather than their complete absence from the diet . . . that is of such importance in the practice of medicine. . . .

"It is common knowledge that malnourished, weakly, and ill-conditioned children are peculiarly susceptible to inflammatory states of the nose, ear, and throat. 'It is almost impossible in winter to keep [such children] in a hospital ward more than a week or two without their developing rhinopharyngitis, otitis, bronchitic- or broncho-pneumonia.' [Holt] . . . Concerning tuberculosis and nutrition, one example will suffice: at Papworth Village Settlement, no child born there during the twenty years of its existence has, while a member of the community, contracted tuberculosis of the lungs, bones, joints, cerebral membranes, nor indeed any clinical form of the disease. Yet these children are the offspring of parents who suffer from tuberculosis, and are in constant contact with them. How has this remarkable achievement been brought about? (1) By adequate nutrition, which maintains the child's resistance to infection, and (2) by the absence of mass-dose infection—procedures which will prevent many other diseases besides tuberculosis. . . . In the domain of dermatology the effects of faulty nutrition on the skin are well recognized; semistarvation, water deficiency, protein deficiency, mineral deficiency . . . and vitamin deficiency. . . . All have harmful effects on this organ and its appendages. Amongst them are dry and inelastic skin, roughening, atrophy, laxness, wrinkling, slow growth of hair, staring hair, loss of hair, slow healing of skin wounds, poor and imperfect cicatrices, furunculosis, ulcers, exudative skin diseases such as eczema and seborrhoea, the skin lesions of pellagra, edema, xerosis; abscesses, inflammatory conditions at the mucocutaneous junctions, the papular conditions known as 'phrenoderma,' hyperkeratosis, petechial hemorrhages and other scorbutic skin affections. . . .

"It is in most cases the patient who must be treated rather than the disease from which he suffers, and in this treatment nothing is so important as maintaining nutrition. . . . In the last resort the patient must, with remarkably few exceptions, heal himself, and it is by adequate nutrition that he can best be put in the way of doing so. Here the newer knowledge comes to the aid of the physician, enabling him by means of refined preparations rapidly to satisfy the needs of the body for the substances that are in default, and thus to hasten cure. . . . We now know that large numbers of our people have not the means wherewith to provide themselves with proper food even though they had the knowledge to enable them to judge of what is proper. . . . Access to abundance of food does not necessarily protect from the effects of food deficiency, since a number of factors—penury, prejudice, ignorance, habit—often prevent the proper use and choice of health-giving foods. To these impediments to normal nutrition I would add indifference, neglect, and the weak indulgence of their children by many well-to-do parents which fosters tastes and habits detrimental to normal growth, nutrition, and health. Education of the people, the better education of ourselves: these are urgent necessities. It may be that the medical curriculum is already overgrown. If so, let it be pruned; let us teach the student less about 'disease' and drugs and more about 'health,' more about nutrition, which is the very basis of health."

FOOD AND HEALTH

The food consumed by the Bembe, a primitive tribe of Bantus in Africa, has been observed by Richards and Widdowson (*Africa,* 9:166, 1936). These natives inhabit the plateau districts of northern Rhodesia and some of them lived largely on food made from millet, while those in many of the villages ate cassava and fish. The food was strikingly small in amount and about half that used by Europeans, and was found to be deficient in protein, fat and vitamin D, but the content of vitamin C varied greatly and that of vitamins A and B was often adequate. Rabinowitch (*Canad. M. A. J.,* 34:487 [May] 1936) has investigated the food consumed by the Eskimos and their ways of eating. Those in contact with civilization ate some food made of flour, but seldom more than 2 oz. each a day; and the carbohydrate content of the food of the more uncivilized was larger than was generally supposed, for they ate plentifully of berries in the summer and the contents of the caribou's stomach in the winter. Thus the average daily food of an adult amounted to about 250 or 300 gm. of protein, 150 gm. of fat and 30 or 40 gm. of carbohydrate. The male Maya indians of Yucatan have a basal heat production that is five to eight times higher than the white men of the temperate

zones. In an attempt to discover the cause of such a difference, Benedict and Steggerda (Pub. No. 456: 155, Carnegie Institute, Washington, D. C., June, 1936) have made an investigation of the ways of eating of these primitive people. The average daily amount of food consumed by a laborer was found to be only 2,565 calories, of which 17 per cent was protein, 13 per cent fat and 70 per cent carbohydrate. Protein was consumed in the form of beef, pork, rodents, birds, and so forth, and eggs; a small amount of cheese, butter or milk was used, the fat being largely derived from lard and the fat of meats and vegetables. The consumption of native cakes largely made of maize comprises a large part of every meal, although beans, yams, squash and tomatoes were eaten, and oranges, plums, custard apples and wild pineapple were consumed. The conclusion was reached that the food consumed by these people did not relate to their unusually high heat production.

An example of unusual health resulting from good nutrition has been described by Owen (*Brit. M. J.*, 1: 173 [Jan. 25] 1936) in observations on the inhabitants of the lonely island of Tristan da Cunha. They numbered only 169, 93 males and 76 females, and they came in contact with the outside world only once a year by the visit of a ship. They were found to live long, to produce unusually well-developed children and to have teeth in the young adults of a very regular formation and free of cavities. They seldom had "colds," and then generally after the ship's visit; infections, venereal diseases and tuberculosis were unknown. The food of these people consisted mostly of fish, penguin and albatross, eggs and milk, as well as potatoes, pumpkins, turnips and cabbage. In a nutritional survey of the people in the lower classes in Ceylon, Nichols (*Ceylon J. Sc.*, Sect. D., Med. Sc. [pt. 1] 4:1 [Apr. 20] 1936) has reported that the food consumed amounted to about 2,200 calories per person a day. This was composed largely of coarse rice with the husk, but millet, dal, gram, several kinds of peas, and fruit also were consumed. Meat was not eaten often on account of its cost, but fish was used, especially by those inhabiting the coastal towns, and small fish that contained appreciable amounts of calcium salts were consumed daily by the children. A comparison of the food consumed by the families of laborers and those of professional men in New Zealand has been made by Gregory et al. (Home Sc. Dept., Otago Univ., Dunedin, N. Z., 1936). In that of the former, meat was consumed twice a day generally, but fruit was consumed at only one of the meals, brown bread was eaten every other day, and green vegetables were seldom used oftener than once a week. Fats, cereal foods and a large amount of sugar were ingested by this class, and while the diet was sufficient in calories and protein, it was deficient in foods containing calcium and iron. In the food of the professional class more eggs, milk, milk products, vegetables and fruit were consumed, and this diet was considered adequate. A precise record of the food usually ingested by middle-class Englishmen has been made by Widdowson (*J. Hyg.* 36: 269 [July] 1936), and another of that by middle-class Englishwomen has been composed by Widdowson and McCance (*J. Hyg.* 36: 293 [July] 1936). A man ate on the average 3,067 calories a day, of which 97.6 gm. was protein, 129 gm. fat and 348 gm. carbohydrate; but a woman ate only 2,187 calories a day, and this was made up of 67, 100 and 233 gm., respectively. The amount of milk used by each was about a pint a day, and the amount of food consumed by men and women was gradually reduced with advancing years.

An interesting comparison of the food given athletes of different nations has been recorded by Schenk (*München. med. Wchnschr.* 83: 1535 [Sept. 18] 1936) from a study of those participating in the 1936 Olympic games. The average intake of food a day, for an athlete, amounted to 7,300 calories, of which 320 gm. was protein, 270 gm. fat and 850 gm. carbohydrate. Some of the special foods consumed were 600 gm. of protein, which consisted largely of beefsteak, for the Japanese, and 1,000 gm. of this food a day for the heavyweight athletes; besides this, many ate five or six eggs, 1 to 2½ liters of milk, enormous quantities of tomatoes and green vegetables, but few potatoes a day; a daily consumption of two or three apples, oranges or bananas by one of them was not unusual. Almost all drank coffee, the Finns a fruit soup, and the French and Italians wine. The food for a contestant, however, was greatly reduced two days before an event, and consisted of substances that produced little residue.

The relation between avitaminosis and gastrointestinal disorders in man has been studied by Stepp (*München. med. Wchnschr.* 83: 1119 [July 10] 1936), and interesting inferences have been drawn. In patients with vitamin A deficiency, the secretion of hydrochloric acid was found to be greatly reduced, and diarrhea with mucosanguineous stools often occurred. Under these circumstances the resorption of the vitamin from ordinary food was evidently interfered with, but the administration of cod liver oil promptly relieved the disorder. In those with vitamin B_1 deficiency, the secretion of hydrochloric acid often ceased, the appetite was lost, atony of the gut was frequently produced, and this usually led to an inflammation of the intestine. In those without vitamin B_2 stomatitis, diarrhea, colitis, intestinal hemorrhages and pellagra were produced. In tol-

erance tests with cevitamic acid, the patients who had gastritis and no hydrochloric acid eliminated much less of the acid than did normal persons; this was thought due to the destruction of the vitamin or to an unusually low reserve of the vitamin. The prevention of a gastrointestinal disorder by an improvement in the diet has been described by Morison et al. (*Lancet,* 1:1472 [June 27] 1936). The observation related to a form of dysentery that occurred frequently in the inmates of a mental hospital, in spite of a diet that had been considered complete and adequate. When more foods containing vitamins were added to the meals, however, the attacks of dysentery were generally prevented.

PREGNANCY, LACTATION AND THE NOURISHMENT OF CHILDREN

The importance of the vitamins for the proper functioning of the female reproductive organs has been observed by Gierhake (*München. med. Wchnschr.* 83:1720 [Oct. 16] 1936). The investigator believed that vitamin E was necessary for the fertilization of the ovum, that vitamin A was essential during pregnancy to prevent blindness after delivery, and that vitamin C was of value in reducing hemorrhage at the time of delivery. From a study of maternal nutrition, Conn et al. (*Surg., Gynec. & Obst.* 62:377 [Feb.] 1936) have reached the conclusion that the normal increase in the weight of pregnant women should be not more than from 20 to 25 lb., and in a proportion of 3, 10 and 10 lb. respectively, for the three trimesters. Such results can best be brought about by the consumption of from 2,000 to 2,500 calories daily; this food should contain 70—100 gm. protein, 18 mg. of iron, 1.6 gm. of calcium, 1—2 gm. of phosphorus and 0.5 gm. sodium chloride. Besides this, a quart of milk, two cups of vegetables, one cup of fruit, one cup of whole cereal, one portion of meat, fish or eggs, and some potatoes should be included in the food consumed every day; cheese and liver should be eaten several times a week.

The value of wheat-germ oil for women who had had previous abortions has been reported by Watson (*Canad. M. A. J.* 34:134 [Feb.] 1936). A dram of the oil was given daily to 37 of these patients during pregnancy, and 29 of them gave birth to living children; in 15 patients with threatened abortion, miscarriages were prevented in 11 by the use of the oil. A somewhat similar report on the use of the oil in patients of the same kind has been made by Currie (*Brit. M. J.* 1:752 [Apr. 11] 1936), and another has been made by Vogt-Moller (*Klin. Wchnschr.* 15:1883 [Dec. 19] 1936). Through the experimental studies of the blood of rats in vitamin E deficiency, Shute (*J. Obst. & Gynaec., Brit. Emp.* 43:74 [Feb.] 1936) has found that a tryptic ferment developed that was similar to one in the blood of women having spontaneous abortions. In the treatment of a few of these patients whose blood was found resistant to tryptic proteolysis, the administration of vitamin E restored the blood to normal, and, with this change, the signs of impending abortion subsided. From exact and comprehensive tests on the blood of women during pregnancy, Plass (*South. M. J.* 29:417 [Apr.] 1936) found that cell volume, hemoglobin and the plasma protein gradually became reduced toward the time of delivery; but within two weeks afterward the hemoglobin returned to normal. The average hematocrit value of the blood was 39.3 per cent early in labor, but it rose to 41.4 per cent on delivery. The results of these tests indicated that the "physiological anemia of pregnancy" was due solely to the dilution of the blood; to prevent it meals containing adequate meat, eggs and green vegetables were found the most valuable.

The value of a soy-bean-milk preparation for feeding infants and adult patients has been reported by Miller and Wen (*Chinese M. J.* 50:450 [Apr.] 1936). For infants, malt sugar, oil and tomato juice were added in proper proportions to a solution of the bean flour; this milk was found especially useful in the treatment of premature infants and malnourished babies, as it had about the composition of cow's milk and was free of bacteria. For adult patients, the preparation proved valuable in the treatment of peptic ulcer, sprue and dysentery. In Leeds (England) many of the school children were found malnourished by Stockwell (*M. Officer* 55:167 [Apr. 25] 1936) and, judging from an examination of the food consumed, the cause was the eating of unsuitable food rather than an insufficient supply. On this account, when these children were induced to drink more milk and eat better proportioned meals the malnutrition was relieved. Through the examination of food selected by school children in Chorley (England), Anderson (*Brit. M. J.* 1:1221 [June 13] 1936) has discovered that tea and toast were generally eaten at breakfast and tea, but that meat, potatoes and tea were the constituents of many luncheons, and that milk, cheese, eggs, soup, fish, other vegetables and fruit were selected infrequently. In spite of these disproportioned meals, however, few of the children were found malnourished. From a comparison of the diseases and disorders that occurred in the children of an English school and the food consumed there over a period of twenty years, Friend (*Brit. M. J.* 2:276 [Aug. 8] 1936) has found (1) a rise in the incidence recently from replacing butter by margarine, (2) a fall in the number of cases of rheumatism

resulting from an increase of animal fat, (3) a decline in gastrointestinal disorders and an increase in height and weight resulting from more complete and better-proportioned food, and (4) an increase in those afflicted with minor infections resulting from eating more sweets. The measures recommended for an improvement in the health of the children included more time for the consumption of meals and periods of rest afterward, better service, a larger variety of food and an improvement in cooking.

A study of the raw fruit diet for intestinal disorders of children has been carried out by Baumann (*Jahrb. Kinderheilk.* supp. No. 42, 155, 1936), and this diet has not been found beneficial. The investigation was based on 15 healthy children, half of whom were infants while the other half ranged from 3 to 14 years of age. The diet produced an increased peristalsis with large bulky stools and a negative balance of nitrogen, and a rapid loss in weight. A raw banana diet was found more effective in the treatment of these disorders than a raw apple diet. From observations on children, with anemia, phlyctenular conjunctivitis and debility, who had been brought up in the rural districts of England, Ball (*M. Press & Circular* 192:303 [Apr. 1] 1936) has concluded that they suffer from hypervitaminosis. In support of this contention, he found that the children brought up under the best conditions were often debilitated, while those who ate food that appeared deficient were rosy-cheeked and robust. An additional point was that when cod-liver oil and fruits were greatly restricted and cakes and sweet foods increased, the disorders were relieved. The occurrence of edema in 43 children without renal or cardiac involvement has been reported by Dodd and Minot (*J. Pediat.* 8:442 [Apr.] 1936). Some of the patients were convalescing from bacillary dysentery, some had had idiopathic diarrhea, a few had been scorbutic, and two had been afflicted with celiac disease; all of the patients were anemic. The food consumed by all of these patients had been grossly deficient, and the appetite of a few had been poor. In treatment, all were given a high protein diet and a few had transfusions; these measures usually brought about an abatement of the diarrhea, an increase of weight, and recovery.

OPHTHALMIA AND DISORDERS OF THE EYE

In a review of the value of the vitamins in ophthalmology, Buschke (*Ztschr. f. Vitaminforsch.* 5:37 [Jan.] 1936) has pointed out the relation of vitamin A to xerophthalmia and night blindness, that of vitamins B and G to retrobulbar neuritis and that of vitamin G to cataract. Besides, vitamin C has been found valuable in the normal maintenance of the vitreous humor, and all the vitamins were required to keep the eyes in a healthy condition. During the period from 1930 to 1935 in Naples, Milano (*Quad. Nutrizione* 3:82, 1936) recorded all the patients he saw with disorders of the eyes resulting from malnutrition. Almost all had gastrointestinal disturbances, and these were considered a contributing cause of the diseases of the eyes. The list included 50 patients with lesions of the eyes from vitamin A deficiency, of whom 20 developed xerophthalmia, 17 keratomalacia and 10 hemeralopia; in addition there were 7 patients with orbital hemorrhages from vitamin C deficiency. Vitamin A injected parenterally into pregnant women with hemeralopia has been found valuable by Edmund and Clemmensen (*Acta med. Scandinav.* 89:69, 1936). Normal vision was restored ten minutes after the injection of 20,000 international units; and it was maintained by the injection of 40,000 units once a week. The therapeutic value of vitamins A and D in the treatment of children convalescing from measles has been studied by Mackay et al. (*Arch. Dis. Childhood* 11:127 [June] 1936). The 700 patients studied were divided into three groups; one group was given 6 dr. of cod-liver oil, another 3,000 units of vitamin D, and a third, receiving no supplement, served as a control. The patients were observed over a period of six months, and during this time no significant difference was found in the mortality, incidence of complications, or duration of the fever.

The vitamin A content of the serum in men of different social groups has been reported by Wolff (*Schweiz. med. Wchnschr.* 66:979 [Oct. 10] 1936); there were 60 "units" per 100 cc. in 60 per cent of 42 students, but this amount was found in only 8 per cent of 80 unemployed men. Several days after the ingestion of 60,000 units of vitamin A by some of these subjects, the amount of this substance in the serum was raised. Through the determination of the least quantity of light required to produce reflex movements of the face and eyes in infants, Friderichsen and Edmund (*Hospitalstid.* 79:1081 [Oct. 13] 1936) have devised a method of estimating the nutrition from vitamin A. Tested by this method, infants on a diet in which a purée of carrots was the source of vitamin A, showed a deficiency, but when cod-liver oil was the source of the vitamin, the absorption was so rapid that deficient infants registered a normal response to light half an hour after taking the oil. The test also showed that the restriction of water in the subjects rapidly exhausted the reserve of this vitamin. Under the title of "Clinical characteristics and the pathenogenesis of carrotenemia," Bounin and Lévinson (*Ztschr. f. Vitaminforsch.* 5:12 [Jan.] 1936) have described some of the signs of this disorder in man; among the most marked were pigmentation of the hands and feet, and a diminu-

tion of cholesterol but an increase of carotene in the blood. Many of the patients had not had foods rich in carotene, but, on account of their having been afflicted with typhus, tuberculosis and especially chronic malaria, there had been a failure to oxidize carotene owing to a depressed action of the liver.

From a statistical study of the incidence of phlyctenular keratitis recently recorded in hospitals of large cities in this country, Redding (*Pennsylvania M. J.* 39:158 [Dec.] 1935) has concluded that the disease has become greatly reduced. The result was thought due especially to the greater use of the vitamins by the people and improved nutrition. On account of the poor physical condition of some patients with superficial keratitis, Stocker (*Schweiz. med. Wchnschr.* 66:335 [Apr. 4] 1936) believed that they had a nutritional disturbance, and administered vitamin A. As a result of this treatment not only did the corneal lesions disappear but the general condition of the patients improved. A few remained free of the disease, but in those in whom it recurred the use of the vitamin again relieved the disorder.

SCURVY AND SKIN DISEASES

The prevention of scurvy has become so prevalent that few reports of its typical development in groups of patients have been made recently. One of these, by Orenstein (Health Dept., Central Mining—Rand Mines Group, Report for 1935, p. 9) showed that only 31 cases developed in a South African mining community during 1935, whereas 76 cases had been diagnosed the previous year. The use of lucerne in the food of the native laborers was not only responsible for this reduction, but also served as a safeguard against the "subscorbutic state" in which infectious diseases were likely to develop or the healing of wounds to be delayed. A few reports of the atypical development of scurvy have been published. One of these, by Platt (*Lancet* 2:366 [Aug. 15] 1936), described the occurrence of the disease in 4 patients. This followed the adherence to very restricted diets for the relief of gastrointestinal disorders; the dangers incident to this treatment were pointed out. Another, by Wood (*Lancet* 2:1405 [Dec. 21] 1936), gave an account of a patient with the disease, complicated by orthochromic and normocytic anemia, and caused by a limited diet to relieve dyspepsia. The saturation of some scorbutic patients with ascorbic acid has been carried out by Schultzer (*Acta med. Scandinav.* 88:317, 1936). In tests before treatment 3 patients were found to excrete 13, 19 and 24 mg. of the acid a day, respectively. The daily injection of 300 mg. of the acid in one patient and of 600 mg. in another, and the ingestion of 600 mg. in a third, for four days, brought about a marked subsidence in the symptoms of the disease. An increase in the rate of excretion by the patients, however, did not occur until the seventh, tenth and seventeenth days, respectively, after taking the acid; and the saturation point was not reached until two, three and five weeks afterward. In 6 patients who had sciatica and served as controls, after the ingestion of 600 mg. of the acid a day for four days, only 2 showed an immediate increase in the rate of its excretion, but all reached the saturation point between the fifth day and the seventh.

A study of the excretion of ascorbic acid in the urine of healthy persons, as well as of patients suspected of being in a prescorbutic state, has been made by Corlette et al. (*South M. J.* 29:37 [Jan.] 1936). In the former the excretion showed a marked variation, a difference of from 12 to 80 mg. a day being obtained; but in the latter it varied between 7.5 and 34 mg. a day. At a tentative normal value for excretion of 20 mg. a day, the results were abnormally low in most of the patients and in a few of the healthy persons. Many of those with low values were given 400 mg. of the acid in the form of orange juice over a period of twelve hours, but in only 7 of the subjects was more than 30 per cent of the dose excreted in twenty-four hours. Harris et al. (*Lancet* 1:1488 [June 27] 1936) determined the ascorbic acid content of the urine of many patients on admission to a hospital, and found it diminished. It was especially low in those on the diet of the hospital for gastric or duodenal ulcers. In a few patients with pneumonia who had large amounts of vitamin C, it was likewise low; the administration of still more of the vitamin to these patients brought about, in time, an increase in the excretion of the vitamin, but did not influence the course of the disease. In a test of a hemorrhagic diathesis in patients suspected of having scurvy, Armentano (*Ztschr. f. klin. Med.* 129:685, 1936) gave a parenteral injection of 300 mg. of ascorbic acid daily and found that those with a diathesis did not excrete much of the acid until the saturation point was reached. Such a result, combined with a lowered capillary resistance test, indicated a severe degree of vitamin C deficiency.

Deggeller (*Dissertation,* University of Utrecht, Holland, p. 88, 1936) has ascertained the ascorbic acid content of the human blood, and has found it to vary from 1.33 to 17.09 mg. per liter. The presence of more than 13 mg. in a patient was considered to constitute a saturated condition, that of 13 to 10 mg. a good one, and that of 10 to 5 mg. a satisfactory one; a content below 5 mg. was termed abnormally low. A seasonal variation of content was found to occur, with a minimum from January to March and a maximum from June to October. Healthy persons were found to require only 1.5 to 3 gm., but tuberculous patients needed 2.4

to 4 gm. daily in their food in order to become saturated. From a study of the ascorbic acid content of human serum in a few persons and patients, Lund and Lieck (*Hospitalstid.* 79:798 [Aug. 4] 1936) have concluded that it should be 0.3 mg. per 100 cc., and that two hours after the administration of 10 mg. of the acid the content of the serum should be increased by 1 mg. per 100 cc.

Some estimable points have been recorded by MacKenna (*Brit. M. J.* 2:581 [Sept. 19] 1936) in an article on "Preventive measures in dermatology." In the treatment of urticaria or rosacea, since patients with these disorders have become relieved by the consumption of an equal amount of food at the three meals instead of eating about 70 per cent of the daily intake at the evening meal, he concluded that the diseases can be prevented by the adoption of these measures. In the treatment of eczema in children Urbach's principles were generally referred to; and stated that, since obese patients responded to a reduction of food, marasmic ones to an increase, and allergic ones to the omission of special foods, the disease might have been prevented if the bodily disorders had not been allowed to develop. The value of breast feeding to prevent eczema in infants has been shown by Grulee and Sanford (*J. Pediat.* 9:223 [Aug.] 1936) from a study of 20,061 babies; the incidence of the disease was found to be twice as great in the partially breast-fed, and seven times as great in the artificially fed, as in the wholly breast-fed. The incidence was greatest at eight months of age and during the winter and spring months. Breast-fed infants with eczema have been found by Rinkel (*Arch. Pediat.* 53:559 [Aug.] 1936) to be sensitive to beef, eggs, spinach and tea, and the condition of the skin improved when these foods were not consumed by the mother.

BERIBERI, PELLAGRA AND NERVE DISORDERS

An outbreak of beriberi among the natives of the southeast Celebes has been ably reported by Fleischer (*Geneesk. tidjschr. v. Nederl—Indie* 75:1975 [Nov. 12] 1935). The epidemic was the result of a failure of the rice crop and the required substitution of sago for rice as the main source of nourishment. Of the 116,500 people in these islands, 3,000 became afflicted, and 1,849 patients were admitted to the hospital. The disease occurred twice as frequently in men as in women, but it did not affect many of the children. The most marked signs of the disease were formication and edema, but these were almost always followed by paresis, atrophy of the fat and muscles, and emaciation. Dilatation of the heart occurred in 60 per cent of the patients, "cor bovis" was found in a few, and the diastolic blood pressure was invariably low. The mortality was unusually low, as only 6 of the patients died, and in every case this was the result of a complication. Rest, a good diet and the administration of vitamins brought about recovery in the remaining 1,843 patients. The development of beriberi in a patient caused by a reducing diet of beef, lettuce and fruit has been reported by Snyder (*Am. J. Digest. Dis. & Nutrition* 3:789 [Dec.] 1936).

The amount of vitamin B_1 excreted in the urine of human beings has been determined by Harris and Leong (*Lancet* 1:886 [Apr. 18] 1936) and found to vary from 12 to 35 international units a day. The administration of single large doses of the vitamin caused an increase in its excretion, and the amount passed was found lowest in the subjects who had the lowest resting level of the vitamin. The excretion by children was in about the same ratio as that by adults, but was proportionate to the weight of their bodies; that by 3 malnourished adults was 2 to 7 units a day, and that by 3 patients with beriberi was only 2.5 units. The excretion of the vitamin by rats afflicted with experimental beriberi was found to reach very low levels. Somewhat similar tests for vitamin B_1 deficiency in patients with pyruvic acid and methyl glyoxal have been carried out on blood and spinal fluid, as well as urine, by Platt and Lu (*Quart. J. Med.* 5:355 [July] 1936). In acute and severe beriberi the bisulfate binding substances of the blood were found much increased, but in the subacute type of the disease they were only slightly raised; in a few patients with wasting diseases, however, high values for these substances were also obtained.

A marked decrease in the mortality from pellagra in Italy has occurred recently, according to comparative statistics compiled by Lutrario (*Bull. Office internat. d'hyg. pub.* 28:688 [Apr.] 1936). In 1883 the death rate from this disease was 225 per million, whereas in 1927 it had been reduced to 1.5 per million. The result has been achieved through laws prohibiting the use of dirty maize for food, through the replacement of maize by wheat generally, and through the establishment of governmental institutions in pellagrous districts where the ignorant were taught the use of proper food. The symptoms of 30 patients with pellagra have been described by Lucksch (*Ztsch. f. klin. Med.* 130:32, 1936). Most of them showed marked signs of malnutrition, 27 had typical lesions of the skin, 16 mental symptoms, 19 gastrointestinal disturbances and 16 hypochlorhydria; 13 gave positive cultures of *B. coli* from the duodenal contents. From a study of patients with pellagra in Rumania, reported by Beniuminovici (*Thesis, Paris,* No. 104, p. 49, 1936) the disease was found to occur most frequently in those from 20 to 40 years of age, and especially in country women as the result of malnutrition, overwork and repeated pregnancies. The disease generally appeared in

the early spring and showed an increasing incidence until June, when it gradually declined. The mortality in one district was 2.62 per cent from 1928 to 1933, and in two others from 2.57 to 3.75 per cent between 1930 and 1934. A report on the food consumed by the peasants in one of these districts has been made by Aykroyd et al. (*Arch. roumaines de path. expér. et de microbiol.* 8:407 [Dec.] 1935). The diet was found to be especially low in animal protein, eggs, fat and milk. The average peasant consumed about 3,000 calories daily, of which the protein was about 100 gm., but the diet was largely derived from maize and therefore of poor quality. The restriction of animal protein was frequently due to religious fasts. Some of the symptoms, but more especially the pathology of pellagra, have been described by Herzenberg (*Beitr. z. path. Anat. u. z. allg. Path.* 96:97, 1935) from postmortem examinations of 17 male and 3 female cadavers. A severe and persistent diarrhea had occurred in all of them as patients, and lesions of the skin and a mental disorder were evident in many. The lesions found were colitis, inflammation of the tongue and mouth, anemia, necrosis of the muscles and pigmentation and inflammation of the skin. Degenerative changes were also found in the pancreas and adrenal glands.

A disease resembling pellagra and called "kwashiorkor," which afflicted many of the native children along the African Gold Coast has been reported by Williams (*Lancet* 2:1151 [Nov. 16] 1935). It was evidently caused by the excessive consumption of maize; it produced diarrhea and pigmented patches of the skin on the elbows and knees, and sores in the corners of the eyes and in the mouth, and edema. In treatment, condensed milk and cod-liver oil proved beneficial in the early stages, but little could be done after the dermatitis appeared. Aykroyd and Krishnan (*Indian J. M. Research* 24:411 [Oct.] 1936) have reported the occurrence of a stomatitis in some of the children of India from a vitamin B_2 deficiency. The food in the institutions where the children lived was largely composed of parboiled rice, and was deficient in protein, vitamins and minerals. Treating the children with cod-liver oil was not beneficial, but through the use of 1 ounce of dried yeast or 1½ ounces of dried skimmed milk daily the lesions of the mouth were relieved in a few weeks.

Through a comparative study of three groups of patients with alcoholic polyneuritis, Jolliffe and Colbert (*J. A. M. A.* 107:642 [Aug. 29] 1936) have stated that the disorder was due to a vitamin B deficiency rather than to the effects of alcohol. In two of the groups the patients were denied alcohol and two and four times the minimum basal amount of the crystalline vitamin, respectively, were given by mouth daily; the patients improved proportionately. In the third group the minimum basal amount only was given, but the patients did not improve until an additional amount was administered parenterally. Some success in the treatment of disseminated sclerosis has been observed by Goodall and Slater (*Edinburgh M. J.* 43:368 [June] 1936) on the assumption that the disorder was due to a lack of vitamins; thus the patients were given food consisting largely of liver, eggs, milk, green vegetables and fruit. Of the 50 patients treated, 9 who had slight signs of the disease returned to work and did not have a relapse during a period of five years, but those who started treatment after organic changes had occurred in the nervous system failed to respond. The parenteral injection of vitamin B in a few patients with progressive polyneuritis, alcoholic neuritis or subacute combined degeneration of the cord has been carried out by Russell (*Edinburgh M. J.* 43:315 [May] 1936) with some success. In those with peripheral neuritis, a diminution in the areas of lost sensation was especially noteworthy.

RICKETS, OSTEOMALACIA, ARTHRITIS AND DENTAL DECAY

The value of viosterol for the prevention and cure of rickets in 300 patients over a period of six years has been observed by Shelling and Hopper (*Bull. Johns Hopkins Hosp.* 58:137 [Mar.] 1936). In the prevention of the disease, full-term infants were found to require 5 drops of the oil, or 1,125 international units of vitamin D daily; but premature infants needed two to three times this amount for the first few months, after which 5 drops daily were sufficient. Patients with mild rickets became healed in a few months from small doses, but those with the disease in the severe form required twice as long to become healed, and then only from large doses. Viosterol was tolerated better and proved more effective than cod-liver oil, and when combined with calcium salts was found valuable in the treatment of tetany in many of the patients. Toxic effects from the use of the oil were not observed during treatment; and in a few of the patients that died of an infection or some other cause, damage to the tissues was not revealed in postmortem examinations. In the administration of vitamin D to prevent rickets, Jeans (*J. A. M. A.* 106:2066 and 2150 [June 13 and 20] 1936) found that if young babies had 340 units a day better muscles and more regular teeth were developed in spite of x-ray evidence of rickets—than in those who had 60 units and were without evidence of the disease. In a critical review of the sources of the vitamin it was found probable that one was of animal and one of vegetable origin, but the former was considered twice as potent as the latter. The amount of 135 units of the

vitamin a day in a quart of milk was thought to be sufficient to prevent rickets, but was not enough to promote optimum growth and well-being in babies. A teaspoonful of good cod-liver oil or 400 units in a quart of milk, however, was adequate to achieve both results. Drake et al (*Canad. M. J.* 34:279 [Mar.] 1936) have made further observations on the use of irradiated milk in the treatment of mild rickets. During the late fall, 102 infants, of whom 24 had mild rickets, were given irradiated and pasteurized milk with 94 units of vitamin D to the ounce. At the same time, 52 infants of whom 8 had mild rickets were given pasteurized milk only. After seven months of treatment the children of both groups were examined for rickets; those in the former group were found free of active signs of the disease, but 11 showed healing and 14 evidence of having been cured, whereas among those in the latter group were 17 who had active rickets, of which one fourth had the disease in a moderate or severe form, while only 7 showed signs of healing and none showed evidence of having been cured.

Osteomalacia of the spinal column in 5 patients has been reported by Meulengracht and Meyer (*Ugesk. f. laeger* 98:961 [Oct. 8] 1936). In the dietary history of 4 of them, it was found that milk, green vegetables or fruit had not been eaten for many years; in that of the fifth, these foods had been eaten of so sparingly that the amount of the vitamin contained in them was insufficient to prevent the disease. After many other kinds of treatment had failed, 4 of the patients responded immediately to a good diet, calcium salts and the administration of vitamin D. In a selected group of patients with hypertrophic arthritis, Wyatt et al. (*Ann. Int. Med.* 10:534 [Oct.] 1936) have tried the effect of massive doses of vitamin D. The amount given was usually 200,000 units daily, but other forms of treatment, including adequate rest, physiotherapy and heliotherapy, the removal of foci of infection, transfusions of blood and other measures, were likewise used. Clinical improvement occurred in 8 of the patients, unfavorable reactions took place in another 8, and the remaining 24 were not benefited. In a study of rheumatic fever and arthritis in children on the basis of a vitamin C deficiency, Rinehart (*Ann. Int. Med.* 9:586 [Nov.] 1935) has obtained favorable results. In tests of the capillary resistance, many of these patients showed a deficiency of the vitamin; the daily use of orange juice added to a good diet reduced the deficiency and restored the health of some of the children. The ingestion of a high-carbohydrate diet and the use of insulin were tried in the treatment of 8 patients with chronic atrophic arthritis by Bowen and Lockie (*J. Lab. & Clin. Med.* 21:505 [Feb.] 1936) and during a period of observation of fifteen to sixty-five weeks a few of the patients increased in weight; one gained 50, another 42 and a third 24 pounds and these improved especially in health. Besides the diet, a large amount of vitamin C was given, and the patients were kept free from worry and exposure; these were considered factors in the clinical improvement. The use of insulin in the treatment was not thought valuable. Since patients after the fracture of long bones often showed a marked loss of nitrogen, Cuthbertson (*Brit. J. Surg.* 23:505 [Jan.] 1936) used a diet that was rich in first-class protein and of a high caloric value. Such a diet was found to reduce the loss of nitrogen and to bring about an improvement in the condition of some of these patients.

The American Council on Dental Therapeutics has given consideration to the prevention and treatment of dental caries (*J. Am. Dent. A.* 23:139, 1936) and has concluded that a well-balanced diet which includes milk and derivatives of milk—even in pregnancy and lactation—is sufficient for the normal development of the teeth. The addition of calcium or phosphorus to the diet is not thought necessary unless the patient has had a deficiency disease. Orban (*Wien. klin. Wchnschr.* 49:992 [July 31] 1936) has reported that the structure of unerupted teeth can be changed by the same factors that alter the calcification of the skeleton, but that after the teeth have come through they are unaffected. Moreover, the resistance of the teeth to caries can be changed through food factors; a diet with a low proportion of carbohydrate to fat, and including many vegetables and some fruit, was found the most valuable. In a routine examination of the teeth of children in an institution in Michigan by Jay et al (*J. Am. Dent. A.* 23:846 [May] 1936) few cavities were found. The results were considered odd, since the food given the children was without butter, contained little milk, few oranges, a small amount of sweet stuff and many dishes made from flour, and was thought to be very inadequate. As an experiment, the children were allowed candy without restrictions for five months, when another examination of their teeth was made. At this time the incidence of caries had increased 30 per cent.

A commendable piece of work has been carried out by Jones and Crosland (*U. S. Nav. M. Bull.* 34:181 [Apr.] 1936) on the relation between nutrition and dental caries in 212 enlisted men of the United States Navy in Hawaii. In an examination of the men's teeth when they arrived at this station, the incidence of caries was found to be 97.6 per cent, and in another made from five months to six years afterward the incidence was 98.1 per cent. Because of the fact that the native Hawaiians consumed a great deal of fruit, roots, tubers and other vegetables and but little milk or cereal food, and almost invariably had sound teeth, the dental decay in the sailors was thought due to the insufficient ingestion of vegetables and

fruit. On this account, the suggestion was made that their food should be changed, vegetables and fruit being increased, milk given in larger amounts, molasses substituted very generally for sugar, and meat reduced. In a study of caries in the teeth of some of the African natives, Price reports (*J. Am. Dent. A.* 23:876 [May] 1936) that those who ate indigenous foods with a high content of minerals and vitamins had few cavities. These natives, too, were superior physically, whereas those who lived near the cities and ate many prepared foods had a higher incidence of caries and an inferior physique. Klatsky (*Dental Cosmos* 78:814 [Aug.] 1936) has observed the relation between mastication and dental caries in 100 male and female subjects. In these persons the normal chewing and the maximum biting pressures were determined by means of a dynamometer, and found to vary from 5 to 30 kg. and 15 to 60 kg., respectively. As the values for the pressure and the number of cavities in the subjects occurred in an inverse proportion, the vigorous mastication of raw, coarse and fibrous foods evidently cleaned the teeth and prevented decay.

THE ANEMIAS, KIDNEY STONES, AND THE METABOLISM OF PROTEIN

Observations on the nutritional anemia of infancy have been carried out by Paxton (*Glasgow M. J.* 125:153 [Apr.] 1936). The cause of the disorder was ascribed to a deficiency of iron in milk, and the anemia generally reached its peak about the third month; but in some infants spontaneous recovery took place after the patients began to consume a mixed diet. The adoption of preventive measures was advocated; to this end, it was stated that infants should be given 5 gr. of iron and ammonium citrate a day from the first to the sixth months, when this dose should be doubled. If the infant was anemic, a daily dose of an ounce of a preparation made up of ferrous sulfate 40 gr., syrup of glucose 1½ oz. and water up to 3 oz., was found most useful to relieve the condition. The total and the "available" ingestion of iron in food of 125 men and women of the middle class in England who were consuming unrestricted diets have been calculated by Widdowson and McCance (*J. Hyg.* 36:13 [Feb.] 1936). The men were found to take in a mean total of 16.8 mg. of iron a day, though 37 per cent of them were daily consuming food that contained less than 15 mg., and of this only 10.8 mg. was in the form of available iron. The women were found to ingest a mean total of even less iron, inasmuch as they took in only 11.4 mg. a day, and 30 per cent of them consumed less than 10 mg.; of the mean total only 7.9 mg. was in the form of available iron. The chief source of iron in the food was meat. The hemoglobin of the men was found to average 102 per cent, while that of the women was 93. In an analysis of the causes of chronic hypochromic anemia in women by Gray and Wintrobe (*Am. J. Obst. & Gynec.* 31:3 [Jan.] 1936) deficient food, functional digestive disorders and excessive demands for hemoglobin were revealed; the correction of these disorders was advocated. During the treatment of a number of patients most of whom had hypochromic anemia, Heath and Taylor (*J. Clin. Investigation* 15:411 [July] 1936) observed that the hemoglobin increased at the usual rate, even when they ate food low in protein and had a negative nitrogen balance. Under these circumstances the nitrogen required for the regeneration of the blood was evidently supplied from the plasma and the tissues, and the daily consumption of more than 6.2 gm. was necessary to produce a retention of nitrogen. A comparison of the value of the ordinary and the Meulengracht treatment of patients made anemic from hemorrhages of gastric ulcers has been made by Schiodt (*Am. J. M. Sc.* 192:163 [Aug.] 1936). At the beginning, those given ordinary treatment had an average hemoglobin of 47.5 per cent and the average corpuscle count was 2.43 million cells, but after a month the hemoglobin rose to only 50 per cent and the cell count to 2.8 million. In those that had the Meulengracht treatment the hemoglobin averaged 50 per cent in the beginning and the corpuscle count 2.42 million cells, but after a month's time the average values had increased to 68.4 per cent and 3.45 million respectively. Patek (*Arch. Int. Med.* 57:73 [Jan.] 1936) tried the effect of chlorophyll derivatives on patients with hypochromic anemia, and found them of little value. Food containing large amounts of animal protein and green vegetables proved very beneficial.

A report on the unusual primary disease of the blood—chlorosis—in a few patients has been made by Patek and Heath (*J. A. M. A.* 106:1463 [Apr. 25] 1936). All the patients had capricious appetites, and this, combined with the ingestion of breads, cakes, tea and few vegetables, was thought responsible for the disease, for such a diet was found to give an average of only 5 mg. of iron a day. In a study of the anemia associated with hookworm in Costa Rica, Peña-Chavarria and Rotter (*Arch. f. Schiffs.- u. Tropen-Hyg.* 39:89 [Mar.] 1935) found that the severity of the disease was most marked in patients who consumed little meat, and that treatment by iron produced blood regeneration without the removal of the worms. A few patients with polycythemia observed by Herzog (*Deutsche med. Wchnschr.* 62:960 [June 12] 1936) were effectively treated in six weeks with a diet very low in protein. After this time, the daily consumption of a little milk, cheese and

fish, and now and then a few eggs, did not cause an increase in the number of corpuscles. Snell (*Arch. Int. Med.* 57:837 [May] 1936) has described the symptoms and treatment of a few patients with nontropical sprue. Steatorrhea, gastrointestinal disturbances, emaciation, tetany, osteoporosis and anemia were some of the common manifestations. Such symptoms indicated that the disease originated from a deficiency of some kind, and was due to a failure to absorb fat, proteins, minerals, vitamins and blood-building substances. In treatment, a diet low in fat and one to which vitamins B and D, calcium ion, parathormone and liver extract were added proved valuable. Milier and Rhoads (*Am. J. M. Sc.* 191:453 [Apr.] 1936) have recommended the use of large amounts of liver extract in the treatment of patients with sprue, because if only a little is used, and that little infrequently, the patients have a recurrence of flatulence, abdominal cramps and diarrhea. Since the amount of this substance was far greater than that required to maintain the hemoglobin at its normal value, the extract evidently exerted some influence on the promotion of the normal intestinal functions.

Observations on the relation between achylia gastrica and pernicious anemia, to disprove the theory of Greenspon have been set forth by Castle and Ham (*J. A. M. A.* 107:1456 [Oct. 31] 1936). They found that normal gastric juice did not contain an effective "antipernicious anemia principle" if it was not mixed with food, and that when this juice was incubated with native pepsin and hydrochloric acid at 37.5° C. for two hours, only a portion of the intrinsic factor was inactivated. Other points noted were that the stomach of the hog contained the thermostable as well as the thermolabile factors and that when beef muscle and gastric juice were used independently they were not effective in the treatment of pernicious anemia. In a comparison of the precursor of the active antianemic substance in liver with Castle's extrinsic factor, Reimann et al. (*Ztschr. f. klin. Med.* 129:659, 1936) have reached the following conclusions: first, that both substances were ineffective until treated with Castle's ferment of the normal gastric juice; secondly, that both were resistant to heat, but the antianemic principle was rapidly destroyed at 80°C.; and thirdly, that both were soluble in water and dilute alcohol but were precipitated by strong alcohol. The results indicated that the antianemic factors in muscle and liver were the same, and that in comparison with the very labile active principle they were inactive and resistant to heat. By the use of a parenteral liver preparation (1 cc. of which was equal to 100 gm. of fresh liver) in 28 patients with pernicious anemia, Murphy (*Am. J. M. Sc.* 191:597 [May] 1936) has obtained very beneficial results. In a relapse of the disease each patient was given 1 cc. a week for four weeks, and in those who had had less than 2,000,000 cells per cubic millimeter, the average increase of cells was 92,000 a day. After having been relieved of the disease, 16 former patients required a dose of only 1 cc. of this preparation every ten to twenty-eight days to maintain the blood at the normal count. Effects of preparations made from the cardiac, fundal and pyloric portions of a pig's stomach, and used in the treatment of patients with pernicious anemia, have been observed by Meulengracht (*Ztschr. f. klin. Med.* 130:468, 1936). The preparation from the cardia was found slightly potent, the one from the fundus was impotent, and the third portion from the pylorus had a marked antianemic effect. The results implied that Brunner's glands, which are situated mostly in the pyloric portion of the stomach, were the source of the antianemic factor. The value of Dakin and West's liver fraction in the treatment of the disease has been confirmed by Ungley et al. (*Lancet* 1:349 [Feb. 15] 1936). In 11 patients with counts of less than 2,000,000 cells per cubic millimeter, divided doses of from 100 to 600 mg. of this preparation brought about an average increase of 2,310,000 cells in forty days. In another group of patients, a single dose of from 100 to 200 mg. or daily doses of 10 mg. produced a marked increase in the reticulocytes in the blood, and thus this preparation brought about results that the others were incapable of producing. A study of the use of liver in the treatment of patients with the nerve degeneration of pernicious anemia has been carried out by Mills (*Am. J. M. Sc.* 191:72 [June] 1936). The patients were divided into two groups; in one, 28 patients were given continuous liver treatment, sufficient to keep the blood at the normal level, while in the other, 17 patients were given sporadic treatment. In the former group, the results obtained were an improvement in 47 per cent and no change in 40 per cent, while 3 of the patients were functionally disabled; in the latter group, while an improvement occurred in 17 per cent, a progressive degeneration took place in 82 per cent, of which 8 patients were partially or totally disabled and 6 died.

The development of kidney stones in the Chinese has been studied by Gray (*Chinese M. J.* 50:761 [June] 1936), who concluded that a disorder of metabolism, combined with lesions of the urinary epithelium from trauma, obstruction or a severe vitamin A deficiency, was responsible. The deficient condition was frequently found in Chinese peasants. The restriction of certain foods for patients with urinary sand or stones has been recommended by Lampé (*München. med. Wchnschr.* 83:804 [May 15] 1936). In general the intake of sodium chloride should be reduced to between 5 and 6 gm. a day and 1.5 to 2 liters of fluid should be taken daily to decrease the density of

the urine. Specifically, when the stones are of uric acid or urate origin the consumption of meat should be reduced to 100 gm. a day, food made from internal organs entirely abstained from and large amounts of alkaline water drunk. When they are of phosphate or carbonate origin, vegetables should be limited, and meat and the cereal foods increased; when of oxylate origin, potatoes, tomatoes, celery and spinach should be restricted; and when composed mostly of calcium, milk, cheese and eggs should be reduced. After kidney stones are removed, according to Higgins (*Surg., Gynec. & Obst.* 63:23 [July] 1936) they should be analyzed and the patient put on a diet to prevent their reformation. Most renal calculi were found to be composed of calcium and magnesium phosphate, and to patients from whom these were removed a high vitamin A and acid ash diet should be administered. Such a diet should make the urine acid (pH 5.0 to 5.2), but if not, the additional daily use of 0.5 gm. of enteric-coated ammonium chloride pills was recommended.

From a study of albuminuria and cylindruria, as related to digestive disorders in infants, Rohmer and Tassovatz (*Rev. franc. de pédiat.* 11:617, 1935) have found that the nephritic signs were increased in proportion to the severity of the disturbances, especially diarrhea; ordinary dietetic measures proved ineffective. The influence of dietary factors on the blood pressure of 600 middle-aged patients has been observed by Klinefelter (*Med. Rec.* 144:446 [Nov. 18] 1936). Of this number, 210 patients were obese and one half of them had hypertension; 300 were normal in weight and only 32 had a high pressure; and 90 were underweight and only 5 had the disorder. The patients in the last class were found to eat 30 per cent more salt, fat and meat than those in the first two classes. When these foods were restricted in all of the patients there was a slight reduction of the pressure; but a low-calorie diet largely composed of fruit and vegetables resulted in an average reduction of 38 lb. in weight and in one patient a drop of 12 millimeters of mercury in blood pressure. The administration of a diet of 800 calories to 42 patients with coronary thrombosis and angina pectoris was found by Master et al. (*J. Clin. Investigation* 15:353 [July] 1936) to bring about an amelioration of the cardiac symptoms, a reduction of blood pressure and pulse rate, and a diminution in the work of the heart. Ill effects or significant changes in the protein, sugar or cholesterol of the blood from the greatly reduced food were not observed for a period of from three to twelve months.

OBESITY AND DIABETES MELLITUS

Obesity in children was thought to be due to overeating rather than to an endocrine disorder generally, by Hamburger (*Wien. med. Wchnschr.* 86:772 [July 4] 1936), and a restriction of food was advocated. The limitation of children's food at home was found difficult, but when 20 to 30 calories per kilogram of body weight was allowed in an institution, a satisfactory loss of weight occurred. Observations on several thousand obese patients have been reported by Hunter (*Proc. Roy. Soc. Med.* 29:411, 1936); of this number only 472 persevered with treatment, and these lost from 21 to 52 pounds during a period of nine months. Many of them were treated as outpatients, and were given a diet of 1,100 calories, of which 65 gm. was protein. The treatment of obesity by means of a diet low in carbohydrate food has been found valuable by Hanssen (*Acta med. Scandinav.* 88:97 [Feb. 28] 1936). Such a diet provided some meat or fish, some fruit and a large amount of green vegetables, but butter, cream, olive oil, eggs, cheese and especially breads were greatly restricted. The food furnished about 1,850 calories, and contained 71 gm. of protein, 117 gm. fat, and 112 gm. carbohydrate. The average loss of weight by the patients consuming this diet was about a pound a week. From a study of obese patients Coombs (*Brit. M. J.* 2:346 [Aug. 15] 1936) has concluded that there are alimentary and endocrine types of this disorder but that both types are due to an excessive ingestion of food in comparison with the expenditure of energy. Furthermore, as the incidence of arthritis, diabetes mellitus and cardiorenal diseases was high in overweight patients, obesity has become a dangerous malady.

In the treatment of diabetes, de Candia (*Nutrition* 5:333, 1935) has recommended that the consumption of food be generally reduced, so as not to exceed more than from 20 to 30 calories per kilogram of body weight. Moreover, the food ought to be varied, and the amount of carbohydrate to be eaten should be determined by the tolerance of the patient to this food, with and without insulin. The amount of protein should vary between 0.6 and 1 gm. per kilogram of body weight, and most of it should be of vegetable rather than of animal origin. Vegetables and fruit of low carbohydrate content should make up most of the diet. The influence of vitamins A and C on the glycosuria of diabetics has been observed by Roller (*Med. Klin.* 32:898 [July 3] 1936). A reduction of butter, cream and eggs, and of vegetables containing vitamin A, in the food of these patients decreased the glycosuria, especially when little protein likewise was consumed; when foods containing vitamin C were eaten in large amounts, a still further decrease in the sugar of the urine occurred. The carrying out of these procedures by diabetics made possible a greater consumption of carbohydrate food without the use of insulin. Through the use of carotene oil by diabetic and nondiabetic children, Heymann (*J. A. M. A.*

106:2050 [June 13] 1936) has found an increase of carotene in the blood; but in the former patients the amount of this substance remained high for some time, while in the others a gradual decline took place. Observations on the use of protamine insulin in 10 adults and 10 children, who had had severe diabetes for three years, have been reported by Sprague et al. (*J. A. M. A.* 106:1701 [May 16] 1936). A single daily dose was found to control the hyperglycemia, after an intervening period of four to five days required to achieve the maximum effect. Ordinary insulin controlled the disease when it was injected into another portion of the body during this early period. In some patients 30 per cent less of insulin was required if it was given in the protamine compound. To determine the response to insulin as an index of dietary management in diabetes, MacBryde (*J. Clin. Investigation* 15:577 [Sept.] 1936) has carried out tolerance tests with one unit of the drug to each 10 pounds of weight in the patient. Through such a procedure, 8 of the patients were found sensitive, since their blood sugar was reduced from 60 to 75 per cent, while 7 of them were resistant, since the sugar was decreased only from 32 to 53 per cent. These patients were older, obese, hypertensive and not likely to have acidosis, and thus were suited to eat more carbohydrate food. McCullagh (*M. Clin. North America* 19: 2005 [May] 1936) has treated some patients with hypoglycemia by a regimen of many meals and of food low in carbohydrate but high in fat, with beneficial results.

TUBERCULOSIS AND CANCER

In an analysis of the food consumed by 187 tuberculous patients according to the standard of Buret and Aykroyd, and reported by Roderigues-Olleros (*Rev. Scandinav. Hig.*, publ. 11:536, 1936), 130 were found to eat less than the required amount of 500 gm. of carbohydrate; 70 consumed less than the required 60 gm. of fat; and 70 less than the required 70 gm. of protein, daily. The amount of food these patients should eat according to the standard was 3,000 calories a day, but 114 of the 187 ate less than this. Freilich and Coe (*Am. Rev. Tuberc.* 34:293 [Aug.] 1936) treated 35 patients who had tuberculosis by supplementary feedings of 800 calories of corn syrup or pure dextrose a day, and found them benefited. All of them had previously shown varied losses and gains in weight on a daily consumption of 1,600 calories, which was composed of 90 gm. of protein, 54 gm. of fat and 218 gm. of carbohydrate. Only 2 of the patients failed to gain weight while taking the supplementary feedings, but a month after the feedings were discontinued 26 patients had lost weight. In tests for ascorbic acid in the urine of 64 tuberculous children on a good diet, Burckhardt and Weiser (*Schweiz. med. Wchnschr.* 66:832 [Aug. 29] 1936) have found the excretion of the acid to vary between 11 and 94 mg. One half of the children were given 300 mg. of the acid daily for four days; in 16 who had active lesions, 5 retained from 100 to 400 mg. of the acid, 4 from 400 to 800 mg., 5 over 800 mg. and 2 none; in the other 16 who had slight or healed lesions, 8 did not retain any of the acid, 6 retained from 100 to 400 mg. and 2 from 400 to 800 mg. The results suggested a relation between the retention of vitamin C and the severity of tuberculosis. A point in the treatment of Addison's disease from the study of a few patients has been reported by Wilder et al. (*Proc. Staff Meet., Mayo Clin.* 11:273 [Apr. 29] 1936). When the potassium in the food was increased from 1.6 to 4 gm. a day, a negative balance of sodium and chlorides, diuresis and an Addisonian crisis were all provoked. The sodium chloride was readily restricted if the potassium in the food was reduced.

In a comparison of the mortality rates of patients in Copenhagen from cancer of the stomach between 1903 and 1907 and between 1913 and 1917, Hindhede (*München. med. Wchnschr.* 83:852 [May 22] 1936) found a decrease of 19 per cent, and in one between 1921 and 1923 and between 1932 and 1934, a decrease of 35 per cent. The lowering of the mortality during recent years was attributed to propaganda for the increased consumption of vegetables and fruit among the inhabitants of this city. In an attempt to find out why the incidence of cancer of the stomach was two and five tenths times greater in Holland than in England, Herbert and Bruske (*Guy's Hosp. Rep.* 86:301 [July] 1936) made a comparative study of the food consumed, the spirituous and malt beverages drunk, and the tobacco used by 500 patients in each country. The Dutchmen were found to eat more rapidly, but consumed less meat, more fruit and milk and more highly spiced food than did the Englishmen; they drank more spirituous but less malt liquor, and smoked more and chewed tobacco as well—a habit uncommon in England. From such a comparison, there appeared to be factors in the Dutchmen's mode of eating and living that might cause an excessive irritation of their stomachs and lead to the development of malignant tumors. From the results of animal experimentation, Lustig and Wachtel (*Ztschr. f. Krebsforsch.* 44:53 [June 18] 1936) were induced to try a vitamin A preparation in the treatment of human cancer. The tumors treated had been diagnosed as epidermoid cancers from preparations of biopsy material. In treatment the preparation was made to contain 40,000 units per cubic centimeter and was either laid on the tumor in compresses or injected directly into it. The treatment was found to reduce the size of the ulcerated areas, but complete healing did not take place until after radium treatment had been applied.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTEMORTEM AND POSTMORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 23381

PRESENTATION OF CASE

A thirty-one-year-old American salesman was admitted complaining of shortness of breath.

About two months before entry the patient had a severe cold, which gradually subsided, but left him with a cough. Initially the cough was nonproductive in character, but it gradually became productive of a moderate amount of mucoid sputum. About a month before entering the hospital hemoptysis occurred. This manifested itself by a small amount of blood welling up into his mouth. Since this episode he began to cough and raise large amounts of sputum, generally white, occasionally yellowish, but never foul in character. For two days prior to admission the sputum became less in amount, but the cough became so severe that he felt strangled during paroxysms and frequently vomited. Following the initial hemoptysis he expectorated varying quantities of blood, which was generally clotted. At times he raised up to a cupful. During the last three weeks there was hemoptysis every day. During his illness he noted gradually progressive dyspnea which became very marked during the two weeks preceding his entry. The dyspnea was present at all times but was increased with exertion. Three days before coming to this hospital he was suddenly seized with severe pain in the right chest and immediately entered another hospital. The pain was sharp and stabbing in character, and was aggravated by inspiration. Repeated injections of morphine were necessary for relief although the pain continued up to his entry here. During the last month of his illness he lost about twenty pounds. There was general malaise and profuse sweating, but no fever, until about three days before admission. His appetite was poor but there was no diarrhea, and bowel movements were regular.

The past history was noncontributory.

Physical examination showed a well-developed and nourished orthopneic young man who exhibited very slight cyanosis. The fingers showed moderate curving of the nails, and the tissue above the nail base was reddened and boggy. There was slight puffiness about the eyes. The pupils were small, the patient having received morphine shortly before examination. The right pupil reacted sluggishly to light, the left did not react. In the upright position when leaning forward there was an evident tracheal tug with each cardiac beat. Examination of the heart, however, was negative. The blood pressure in the right arm was 142/72, in the left arm 128/72. The area of supracardiac dulness measured 7 cm., the enlargement being chiefly to the right. There was constant inspiratory and expiratory stridor and a frequent harsh metallic cough. The right chest exhibited lessened expansion and there were dulness, absent breath sounds and tactile fremitus at the right base posteriorly up to the ninth rib. No rales were heard. Abdominal examination was unsatisfactory but the liver was felt two fingerbreadths beneath the costal margin.

The temperature was 100° F., the pulse 110. The respirations were 30.

Examination of the urine showed a specific gravity of 1.024 and was otherwise negative. The blood showed a red cell count of 4,400,000, with a hemoglobin of 75 per cent. The white cell count was 10,200, 65 per cent polymorphonuclears. Repeated examinations of the sputum showed no tubercle bacilli. A blood Hinton test was negative.

X-ray examination of the chest showed a clear left lung but the left side of the diaphragm exhibited exaggerated excursion. The right side of the diaphragm was not seen. The heart was slightly displaced toward the right, and there was a 2 cm. rounded mass in the right lung at the level of the nipple. Homogeneous dulness occupied the right base up to the level of the fourth rib. This dulness was rather triangular in shape with its base toward the lung root. There was a large smooth mass to the right and in front of the trachea extending from the episternal notch to the carina. There was also another mass within the carina which elevated the right main bronchus. Both the right main bronchus and the trachea were apparently markedly compressed. Films taken at expiration showed trapping of air in the upper lobe.

The patient was given a course of x-ray treatment to the chest, 600 r units to the front and back. At the end of a week the patient appeared to be more comfortable and was able to lie flat. There was slight pleuritic pain in the right chest which was referred to the right side of the neck. With elimination of the narcotics both pupils became normal in size and reacted normally to light and distance. On the seventh hospital day an x-ray of the chest showed very little change. There was, however, a definite increase in radiance at the right base and several of the linear areas of density above the right diaphragm had disappeared. On the twelfth day the patient complained of severe pain in the left chest although no abnormal phys-

ical signs were elicited on this side. Following this he complained of severe pain in the left leg, and edema became evident. Another chest film showed very little change on the right side. There was, however, a new area of dulness on the left side which partially obscured the costophrenic angle. This area presented a mottled appearance and exhibited no sharp outline. Another film a few days later showed definite increase in the dulness at the left base but no change in the mediastinum or right base. The blood at this time showed a red cell count of 3,800,000, with a hemoglobin of 60 per cent. The white cell count was 17,700, 89 per cent polymorphonuclears. On the twenty-second hospital day the patient complained of right frontal headache and there was blurring of vision but no diplopia or vomiting. Examination showed reduction of visual acuity to less than 20/70 in each eye. Visual fields showed contraction of the nasal side on the right. X-ray films of the skull and sinuses were negative. On the thirtieth hospital day another chest film showed an increasing amount of fluid at the right base. The left side of the chest had changed markedly and there was now hazy dulness with ill-defined borders occupying the lower third of the lung field, obscuring the outline of the diaphragm. Throughout the entire hospital course the patient's temperature had fluctuated between 98.6 and 101° F. Following a bronchoscopy it rose rapidly to 105° F. He failed rapidly and died 2 days later, on the thirty-seventh hospital day.

Notes on the History

Dr. William B. Breed: Considering the events following the onset of this disease, one ought to be cautious about putting too much emphasis on the severe cold which ushered in his illness because, as the story develops, one certainly gets the impression that this is not an infectious process. The hemoptysis up to a cupful is honest, thoroughgoing hemoptysis and cannot be explained by anything but a basic hemorrhage somewhere in the respiratory tract. The symptoms as they are presented in the history seem to indicate some sort of pressure phenomenon. You will see that he had paroxysms of cough, without much sputum, which were so severe at times as to make him vomit, and later on he developed a metallic cough. On physical examination a tracheal tug was present, which would indicate that there was something in the mediastinum in relation to the bronchi or trachea so adherent that with the movement of the heart a tracheal tug was produced. The progressive dyspnea fits perfectly well with this conception of the process; namely, mechanical interference with breathing, not due to heart disease or to loss of lung capacity as such. He had marked loss of weight which leads one to suspect that he had some sort of malignant progressive process, although many patients who are coughing a good deal, to the point of vomiting, as it says here, do not take enough calories to keep their weight up. I rather suspect also that he had fever for a longer period than is indicated in the history. It says that he had no fever until three days before admission. He had had this disease for two months and if he had fever up to 101°F. before this last crisis, he probably had fever for a longer period. I call your attention also to the profuse sweating which lends a certain amount of support to the diagnosis which, unless the x-rays and further discussion upset it, I would put down as No. 1. There is proof that he had early clubbing of the fingers, which we call chronic pulmonary osteoarthropathy and which is not always a chronic condition. We often see people with empyema develop clubbing of the fingers within a week or two, a symptom which disappears with the cure of the draining sinus. The mechanism of clubbing of the fingers is still unknown, and one may find marked clubbing of the fingers with a lesion in the lung so small that it could not possibly disturb the circulation significantly. The pupils were small and one did not react. That is another symptom which might well be due to pressure in the mediastinum, more on one side than on the other. The difference in the blood pressure is interesting, but there again I call your attention to the fact that every now and again one finds patients who are normal in every way and yet have a blood pressure which varies a good deal, even up to twenty points, between one arm and the other. In this case, however, it certainly fits in with the tentative diagnosis of a disturbance due to mediastinal pressure. There was an area of supracardiac dulness which at once brings up the question as to whether there was present an aneurysm or a substernal goiter.

I will read again the report of the examination of the chest at that time. "The right chest exhibited lessened expansion, and there were dulness, absent breath sounds and tactile fremitus at the right base posteriorly up to the ninth rib." No rales were heard. That situation may certainly be explained by a partial collapse due to pressure on the right bronchus. In fact, the compression may be localized to the bronchus to the right lower lobe. That fits in with the movement of the heart to the right side. If there were a large plug in that bronchus, there would be complete collapse. The diaphragm would be pulled up, the heart pulled way over and the lower space in the right pleural cavity would be practically obliterated. That is called massive collapse; I

should call this partial collapse. Otherwise the physical examination of the chest gives us no lead. There is no evidence here of any fluid, only absence of tactile fremitus and breath sounds.

The urine is perfectly normal. There is a questionable leukocytosis at this time—10,500 white cells, with 65 per cent polymorphonuclears, which is not indicative of anything definite. There was apparently enough sputum to examine thoroughly and rule out tuberculosis, and a blood Hinton test was negative. The negative Hinton test gives one a good deal of comfort in relation to an aneurysm because I suppose ninety-five per cent of the patients with cardiovascular syphilis have positive serology. I should like to have Dr. Schatzki comment on the original x-ray. The patient was given a course of x-ray treatment to the chest, 600 r units to the front and back. That is a very important statement, because 600 r units is the usual lymphoma dosage. It confirms my own opinion that this case is probably lymphoma although there are certain things about the progress later on,—the cerebral symptoms, for instance,—which I cannot quite explain. The patient was given a lymphoma dose and felt much more comfortable at the end of a week and was able to lie down. You will see that several areas of density above the right diaphragm had disappeared. If they had thought that this was bronchiogenic carcinoma of the lung, they certainly would not have treated him with this amount of x-ray.

Dr. Castleman: Very often this amount of x-ray treatment is given merely as a diagnostic measure.

Dr. Breed: Certain things are not conclusive but the patient did improve some, and the fact that there was no great change in that short time does not rule out lymphoma. Maybe Dr. Schatzki will tell us differently when he arrives.

As one reads on, one finds that the process in the chest progresses and then there appears a process in the other lung and finally symptoms of some sort of cerebral disturbance begin. I find it difficult to imagine lymphoma metastasizing as such. On the other hand, one can say that lymphoma may be present in the brain and that the process is progressing in the brain as well as in the chest.

A Physician: What about the possibility of an ordinary embolus hitting the brain?

Dr. Breed: That is perfectly possible. You mean an embolus going from the lung through the heart into the left carotid artery. It is perfectly possible because this does sound embolic; but I do not quite like the mechanism of that.

X-Ray Interpretation

Dr. Richard Schatzki: I do not know anything about the patient and I am going to interpret from the films alone without the benefit of the clinical history. There might be some difficulty in distinguishing the right and left sides. This looks like the left ventricle and not the right ventricle. This is a pathologic mass, a mediastinal mass which is above the region of the right hilus. Here is the pulmonary artery on the right side. It displaces the trachea slightly to the left. I cannot see the mass definitely in the lateral view. In addition to this mass there is fluid in the right pleural cavity along the lateral chest wall. It goes into the interlobar septum. In addition to the fluid, there is something wrong with the right lower lobe. The question is whether it is atelectasis or some other process in the lobe. I would say that one could not differentiate from these films. In favor of atelectasis would be the facts that the right diaphragm is high in position and that the heart is slightly displaced to the right side. Without knowing anything about the story this could be a tumor of the bronchus producing a partial collapse of the right lower lobe, and possibly the middle lobe. It is a very poor procedure to interpret without knowing the slightest thing about the story. A bronchiogenic carcinoma or any tumor around the hilus would produce the same changes which cause interference with aeration of the lower lobe. That is as far as I would go with these films.

Dr. Breed: How soon after lymphoma dosage to the chest would one expect to find changes if the process were lymphomatous?

Dr. Schatzki: Definitely in four weeks, although one may get it earlier.

Dr. Breed: Is it not important that he improved clinically four or five days after receiving 600 r units anteriorly and posteriorly?

Dr. Schatzki: There is questionable improvement by x-ray too, although the mass in the upper mediastinum has not changed at all.

These are films taken eight days later. It is not easy to compare portable films with seven-foot films. The lesions themselves are more magnified in the portable films. It would not be so bad if one had that factor subtracted. They are magnified disproportionately, moreover, so that the chest diameter is less magnified than the mass at this time. It is dangerous even to try to compare sizes from films taken at different distances. There is certainly no change in the mass in the upper mediastinum, however, after three weeks. In addition there is loss of air in the left lower lung field which could be atelectasis or pneumonia. The diaphragm has not gone upward. There is consolidation in the left lower lobe in addition to

the previous findings. The amount of fluid has increased slightly.

DR. BREED: I had gathered from reading this over that there were multiple lesions in the chest and that was one reason I at first favored lymphoma. Apparently the lesions in the left did not occur until some time after the initial x-ray, so that really we have only one original lesion here. Is not that so?

DR. SCHATZKI: Yes, one-sided at the time of the original examination. The huge hilar glands do not appear changed in any pictures. In addition to that there appears to be atelectasis of the lower lobe.

DIFFERENTIAL DIAGNOSIS

DR. BREED: Of course, hemoptysis in itself is not what one would expect of peribronchial lymphoma and does favor a bronchial malignant process. I was trying to build up a diagnosis of lymphoma as against bronchiogenic carcinoma but cannot do so.

DR. SCHATZKI: Some mediastinal lymphomas do not respond to the usual lymphoma dosage, which is probably due to the large diameter of some chests. Sometimes we do not get a definite response with a dose of 600 r units.

DR. BREED: The patient's age is another reason why I lean toward bronchiogenic carcinoma. The patient had cerebral symptoms probably due to embolic phenomena. There were other emboli also present in the right leg. As was suggested, these could be explained by a blood clot going from a pulmonary vein through the systemic system, or by a metastatic process. I do not expect lymphoma to metastasize. There is a remote possibility that the patient might have had lymphoma in his head and that it had started to progress. On the other hand, there seems to be a definite direct connection between the lung, head and leg pathology, so that in spite of his youth and because of his hemoptysis and because of the discussion we have had on the x-rays and the embolic phenomena, I think that I would probably lean more toward bronchiogenic carcinoma than to lymphoma. Are there any questions?

DR. CASTLEMAN: You would say that the cerebral symptoms were due to metastases from the bronchiogenic carcinoma?

DR. BREED: Yes. This is the kind of case about which one cannot really come to a conclusion in one's library. One has to bring it out into the open and talk it over, and in so doing often change the point of view. I was leaning more to lymphoma and I had to change. I think it is probably bronchiogenic carcinoma.

CLINICAL DIAGNOSIS

Carcinoma of the left lower bronchus.

DR. WILLIAM B. BREED'S DIAGNOSES

Bronchiogenic carcinoma.
Metastases to the brain.

ANATOMIC DIAGNOSES

Epidermoid carcinoma, grade III, of the lung with metastases to the mediastinal lymph nodes.
Endocarditis, acute bacterial, mitral.
Cerebral embolism and infarction.
Thrombosis of the popliteal vein, right.
Pulmonary infarct, septic.
Pleuritis, acute fibrinous.
Infarcts of the spleen and kidneys.
Pulmonary atelectasis.
Bronchiectasis.
Empyema, slight.

PATHOLOGICAL DISCUSSION

DR. CASTLEMAN: At autopsy we found a large mediastinal mass measuring about 9 cm. across. The trachea was pushed over to the left and the left main bronchus still further deflected laterally by a mass of glands centering particularly about the bronchus to the lower lobe. They served to push the right main bronchus upward and the left main bronchus to the left, thus causing a widening of the carinal angle. It is my impression that this is strong evidence of carcinomatous infiltration of the glands. Lymphoma rarely produces it perhaps because such glands are too soft. In the wall of the bronchus to the right lower lobe was a tumor which projected into the lumen somewhat but did not produce complete occlusion. This turned out to be an epidermoid carcinoma, grade III. The right middle and upper lobes were perfectly all right. The right lower lobe showed signs of infection secondary to the partial obstruction, with bronchiectasis as well as atelectasis. In the pleural cavity on the left side we found about 40 to 50 cc. of purulent material, and at the periphery of the left lower lobe, corresponding to the x-ray findings, was an abscess, probably a broken-down septic infarct, since the artery leading to the region was occluded. The other lobe was negative. On opening the heart we found a fairly acute endocarditis on the mitral valve which was the source of many emboli, three of which had traveled to the brain and produced softenings in the parietal, frontal and occipital lobes. There was no evidence of tumor in the brain. Emboli and consequent infarctions were also found in the spleen and kidney. The source of the embolus to the right lower lobe was accounted for by a thrombus in the right popliteal vein.

CASE 23382

Presentation of Case

A sixty-six-year-old American housewife was admitted complaining of vaginal bleeding.

The patient's catamenia had ceased at the age of forty-five years and there had been no symptoms referable to her genitourinary tract until three months before entry. At this time she first noted slightly bloody vaginal discharge. This continued but was more marked during micturition. The discharge varied from pink-stained watery material to pure blood but was never very profuse in amount. For about a year there had been a nocturia of three times and occasional burning with urination. She had lost about 10 pounds during this period. A cystoscopy performed in the Out Patient Department was negative. An intravenous pyelogram was negative. No other symptoms of significance were elicited.

The patient had been married for thirty-four years but had never been pregnant. Her past history was otherwise noncontributory.

Physical examination showed a well-developed, obese woman in no acute discomfort. The heart was normal. The blood pressure was 150/80. The lungs were clear. The abdomen was negative. Vaginal examination showed the presence of a thin sagittal septum extending the full length of the vagina. A bloody vaginal discharge was noted but the point of origin could not be determined. The cervix was negative to palpation but could not be visualized with the vaginal speculum. The fundus appeared slightly enlarged but was movable. The fornices were normal, and rectal examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine showed a specific gravity of 1.018 and a slight trace of albumin. The sediment contained many white blood cells and an occasional red blood cell. The blood showed a red cell count of 5,000,000, with a hemoglobin of 80 per cent. The white cells numbered 12,300. A blood Hinton test was negative.

On the third hospital day an ether examination was performed. She was found to have a double vagina and cervix. The left side of the vagina and cervix could be readily visualized. It was impossible to do a curettage. The cervix on the right side could be palpated but not visualized. A laparotomy was performed.

Differential Diagnosis

Dr. Edward L. Young: Vaginal bleeding in a woman of sixty-six makes us think of three conditions in the following order: malignancy, fibroid and polyp. She is rather old to expect bleeding from a hyperplastic endometritis due to the hormonal stimulation of a granulosal cell tumor of the ovary. The amount of bleeding might change our viewpoint because once in a while a trivial amount may be due to a urethral caruncle, and in a person who is very unobservant the blood in the toilet may actually have come from the bladder when it was supposed to be from the vagina. We think of this the more here because it is emphasized that this symptom was more marked during micturition. Apparently the physicians here considered the possibility that the blood was coming from the urinary tract and ruled it out by cystoscopy and study of the kidneys. Of course there are many causes for sterility but where there are other symptoms pointing toward the pelvic organs, we wonder if a slowly growing fibroid has been present for years.

The physical examination does not show us anything until the local examination is reached and then there is evidence of congenital malformation. I think that when this is extensive enough to produce a vaginal change there is certainly a bicornate uterus above because, though it is not uncommon to see a double fundus, it is much less common to see a double cervix and fundus, and still less common to see the whole tract divided. The examination otherwise does not tell us anything definite. The good blood picture would seem to rule out a malignancy which had extended very far. Of course it does not tell us that there is none present.

I am interested that at operation they say they could not do a curettage. That must mean an extremely small cervical canal and fundus. They do have evidence, however, that the bleeding came from the fundus, and I see nothing for it but operation. We are just as much in the dark as to diagnosis as ever, and it still seems to me that we have three possibilities to consider: carcinoma, intramural fibroid and polyp. I should assume that at this age the only safe thing to do was a hysterectomy.

Preoperative Diagnoses

Carcinoma of the fundus?
Double cervix.
Maldevelopment of the uterus.

Dr. Edward L. Young's Diagnoses

Carcinoma of the uterus?
Intramural fibroid?
Polyp of the uterus?

Anatomic Diagnoses

Uterus duplex bicornis.
Adenocarcinoma of one body of the uterus.
Endometrial polyp of the other body.
Leiomyomata uteri.

Pathological Discussion

Dr. Benjamin Castleman: Usually when one lists three possibilities one hopes that the first diagnosis will be correct. In this case Dr. Young has made a "three base hit"—all three diagnoses are correct. Here is the specimen. First of all you see a complete bicornate uterus with two cervices and two fundi. In one fundus is a large, shaggy, gray, friable adenocarcinoma. In the other is a pedunculated endometrial adenomatous polyp. Either of these could have produced the bleeding, but it is most likely to have arisen from the cancer. There is also a well circumscribed intramural leiomyoma measuring about 3 cm. in diameter.

Bicornate uterus with carcinoma in left horn and polyp in right. Note the leiomyoma beneath the polyp.

REPORT OF THE BOARD of HEALTH.

THE Board of Health for the town of *Boston*, are happy to have it in their power, this day, to announce to their fellow-citizens the result of one of the moſt complete experiments which perhaps has ever been made, to prove the efficacy of the *Cow-Pox*, as a preventive againſt the *Small-Pox*; and while they take the liberty to congratulate the public on this important diſcovery, they do earneſtly recommend its introduction generally, and are confident that it will be the means of preſerving the lives and adding to the happineſs of millions.

The utmoſt care has been taken, during the experiments; and a detailed ſtatement of facts are ſubjoined, for the gratification of every enquirer.

In June, 1801, Dr. JACKSON addreſſed a letter to the Board of Health, requeſting their countenance in certain experiments which he contemplated making, to prove the efficacy of the Cow-Pox, as a preventive againſt the Small-Pox; to which application the avocations of the Board would not permit that attention which the plan propoſed by Dr. JACKSON required.

In June, 1802, Dr. WATERHOUSE made a ſimilar application, accompanied with a very minute hiſtory of that diſorder, from himſelf, and alſo various documents in proof of its utility, from Societies in *New-York* and elſewhere, who had aſſociated for the purpoſe of making experiments ſimilar to thoſe propoſed to be made by Dr. W. by which it appeared, that the public in thoſe places, were deriving incalculable benefits by a pretty general inoculation. About this time the Small-Pox was raging in the family of Mr. HOLDEN, *Fiſh-Street*, and three perſons out of five, under the care of the Board of Health, had died.—The Cow-pox had obtained much credit.

The Board of Health, deeply affected with the fatal ravages of the Small-pox, in the family before mentioned, and viewing their Inſtitution as founded, under GOD, for the preſervation of the health of their fellow-citizens; and believing, as they did, that this mild and ſafe diſorder, "*the Cow-Pox*," might be ſubſtituted for that fatal and diſtreſſing one, the Small-pox, ſo that if generally adopted, completely to annihilate and blot it from the catalogue of human woes;—determined, under the influence of theſe conſiderations, to prove by experiments, to be made under their immediate obſervation, whether their faith in the efficacy of the Cow-pox was well founded or not.

With this view, the plan of the experiments propoſed were publiſhed in the newſpapers, for the conſideration of their fellow-citizens. The Secretary of the Board was alſo directed, in their name, to deſire the aſſiſtance of Doctors LLOYD, DANFORTH, RAND, JEFFRIES, WARREN, JARVIS, and WATERHOUSE, who, agreeably to the invitation of the Board, met them at the Health-Office.—Various impediments preſented themſelves in carrying into effect the plan as publiſhed. It was alledged, that the diſtance of *Rainsford's-Iſland* from town, would prevent the attendance of the gentlemen concerned, as often as would be requiſite; and to make them in town, it would be neceſſary to have the permiſſion of the town, in town-meeting, it being contrary to law to inoculate with the Small-pox without it. It was therefore determined to apply for this privilege; and the town being aſſembled for that purpoſe, it was objected to, on the grounds that it would alarm the country, and injure the trade of the town.—After much debate, it was voted by the town—"That the Board have power to make the experiments propoſed, without the limits of the town; and to take up ſuitable buildings, &c. for that purpoſe." It was with much difficulty a place could be obtained, comporting with the vote of the town. But ſtarted in the purſuit, the object, the happineſs of mankind, the Board was determined that no difficulties which perſeverance could ſurmount, ſhould divert them from their purpoſe.

At length Mr. WILLIAMS gave permiſſion to erect a ſmall building on *Noddle's Iſland*, and to make the propoſed experiments there. Thus provided, on the 16th day of Auguſt, nineteen children, viz.

DANIEL SCOTT, *Chambers-Street.*
ALMARIN CLARKE, *Cornhill.*
JOHN SILSBY, *Prince-Street.*
OZIAS GOODWIN, } *Charter-Street.*
GEO. GOODWIN, }
SAMUEL WATTS, }
SAMUEL RICHIE, }
ROBERT WILLIAMS, } *Cole Lane.*
HENRY WILLIAMS, }
REUBEN LORING, *Willſon's Lane.*
THOMAS TRUMAN, } *Dagget's Alley.*
E. L. TRUMAN, }
JOHN WYER, }
SETH KING, } *Market-Square.*
GEORGE FOSS, }
WILLIAM AUSTIN, } *Fiſh-Street.*
JOHN HARRIS, }
THOMAS SPEAR, *Friends-Street.*
WM. GREENE, *Hanover-Street,*

Were inoculated with the Cow-pox, at the Health-Office, in preſence of the Board, and of a number of gentlemen invited. The phyſicians who attended were Drs. *Lloyd, Rand, Jeffries, Warren, Waterhouſe, Welſh, J. C. Howard*, and *T. Danforth*; and the children went through the diſorder to the ſatisfaction of the gentlemen phyſicians, and of this Board.

Freſh Small-pox matter being obtained, through the politeneſs of Dr. WEEKS, the proprietor of the Small-pox Hoſpital at *Falmouth*—on the 9th of November, twelve of the children before named, together with *George Bartlett*, ſon of Dr. *Bartlett*, of *Charleſtown*, who had the Cow-pox two years ſince, were inoculated at the Hoſpital erected on *Noddle's Iſland*, with the Small-pox, from the matter obtained from Dr. *Weeks*—and at the ſame time two children of Mr. *Chriſtopher Clark*, of *Hinchman's Lane*, viz. *Thomas* and *John*, who had never had either the Cow-pox or Small-pox, were alſo inoculated with the latter; and in the proper time the arms (of the two *Clarks*) became inflamed—the ſymptomatic fever, and uſual appearances attending the Small-pox, appeared—and finally puſtules to the amount of about 500 on one, and 150 on the other, put forth and matterated, as has been invariably the caſe in all inſtances of the ſmall-pox within our knowledge. From theſe two children, thus affected with the Small-pox, freſh matter was taken, and the thirteen children before named, who were totally unaffected with the firſt inoculation with Small-pox, were again inoculated on the 21ſt day of November; and the other ſeven children, who had the Cow-pox as firſt mentioned, were alſo inoculated with freſh matter from the *Clarks*; and the whole remained together in the ſame houſe, in the ſame room, and often in the ſame beds, without producing the leaſt appearance of the Small-pox, either by uncommon forenefs of the arm, head-ach, the leaſt degree of fever or puſtules—and this we certify to the public, having daily viſited the Hoſpital ourſelves, and made the moſt critical obſervations and inquiries, which are confirmed by the report of the phyſicians who attended the experiments (hereto annexed) and therefore are confident in affirming, That the Cow-pox *is a complete preventive* againſt all the effects of the Small-pox upon the human ſyſtem.

THE PHYSICIANS' REPORT.

WITH a view of aſcertaining the efficacy of the Cow-pox in preventing the Small-pox, and of diffuſing through this country the knowledge of ſuch facts as might be eſtabliſhed by a courſe of experiments inſtituted for the purpoſe, and thereby removing any prejudices, which might poſſeſs the public mind on the ſubject, the Board of Health of the town of *Boſton*, in the courſe of the laſt Summer, came to a determination to invite a number of Phyſicians to cooperate with them on this important deſign; and with a liberality becoming enlightened citizens, erected a Hoſpital on *Noddle's-Iſland*, for carrying it into execution.—Accordingly, on the 16th of Auguſt laſt, nineteen boys, whoſe names are ſubjoined, were inoculated for the Cow pox at the office, and in preſence of the abovementioned Board, with freſh, tranſparent Cow-pox matter, taken from the arms of a number of patients then under this diſeaſe. Theſe all received and paſſed through the diſeaſe to the complete ſatisfaction of every perſon preſent, converſant with the diſeaſe.

On the 9th of November, twelve of the above children, together with one other, GEORGE BARTLETT by name, who had paſſed through the Cow-pox two years before, were inoculated for the Small-Pox on *Noddle's-Iſland*, with matter taken from a Small-pox patient in the moſt infectious ſtage of that diſeaſe. The arms of theſe lads became inflamed at the inciſions, in proportion to the various irritability of their habits, but not to a degree greater than what any other foreign, virulent matter would have produced. The Small-pox matter excited no general indiſpoſition whatever, through the whole progreſs of the experiments, though the children took no medicines, but were indulged in their uſual modes of living and exerciſe; and were all lodged promiſcuouſly in one room.

At the ſame time and place, in order to prove the activity of the Small-pox matter, which had been uſed, two lads, who had never had either the Small-pox or Cow-pox, were inoculated from the ſame matter. At the uſual time, the arms of theſe two patients exhibited the true appearance of the Small pox. A ſevere eruptive fever enſued, and produced a plenteous crop of Small-pox puſtules, amounting by eſtimation, to more than five hundred in one, and two hundred in the other.

When theſe puſtules were at the higheſt ſtate of infection, the thirteen children before mentioned, were inoculated a ſecond time, with recent matter, taken from the puſtules, which ſaid matter was likewiſe inſerted into the arms of the ſeven other children, who were abſent at the firſt inoculation.—They were all expoſed, moſt of them for twenty days, to infection, by being in the ſame room with the two boys, who had the Small-pox, ſo that, if ſuſceptible of this diſeaſe, they muſt inevitably have received it, if not by inoculation, in the natural way.

Each of the children was examined by the Subſcribers, who were individually convinced from the inſpection of their arms, their perfect ſtate of health, and exemption from every kind of eruption on their bodies, that the Cow-pox prevented their taking the Small-pox, and they do therefore conſider the reſult of the experiment as ſatisfactory evidence, that the *Cow-pox is a complete ſecurity againſt the Small-pox.*

JAMES LLOYD.
SAMUEL DANFORTH.
ISAAC RAND.
JOHN JEFFRIES.
JOHN WARREN.
THOMAS WELSH.
BENJAMIN WATERHOUSE.
JOSIAH BARTLETT.
JOHN FLEET, JUN.
JOHN C. HOWARD.
THOMAS DANFORTH.

Charleſtown, December 15, 1802.

This may certify, that my ſon, GEORGE BARTLETT, at the age of eight years, was inoculated for the Cow-pox, on the 11th day of November, 1800; that the appearance of his arm, and the ſymptoms, ſo fully correſponded with the plates and publications I had then ſeen, as to convince me, and others of my medical friends, that he had the *diſeaſe*.

JOSIAH BARTLETT,
Fellow of the Maſſ. Med. Society.

To the Preſident and Members of the Board of Health, Boſton.

Boſton, Dec. 8th, 1802.

We, SUSANNA TRUMAN and LUCY LEARNED, nurſes attending on the experiments corroborating the efficacy of the Cow-pox—do certify that there was not the leaſt ſickneſs or appearance of Small-pox among any of the children who were ſubjects of the ſame, during their ſtay at *Noddle's-Iſland*, excepting the two boys, THOMAS and JOHN CLARKE, who had never had the Cow-pox, and were inoculated for the Small-pox, with a view to render the experiment more complete.

SUSANNA TRUMAN.
LUCY LEARNED.

Health-Office, Boſton, Dec. 16, 1802.
Publiſhed by order of the Board of Health.
ISAIAH DOANE, *Preſident.*
R. GARDNER, *Secretary.*

RUSSELL AND CUTLER, PRINTERS.

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AN EARLY REPORT ON VACCINATION FOR SMALLPOX

There has recently been acquired by the Boston Medical Library, through the kindness of Mr. John Howland, of Boston, a fine copy of a broadside issued by the Board of Health of Boston December 16, 1802. Mr. Howland is a descendant of the brother of the then president of the Board of Health, Mr. Isaiah Doane, and the broadside was recently found among the family papers. Although not unknown, for there is a copy in the library of the Massachusetts Historical Society and also one in the office of the Surgeon General, Washington, this document, nevertheless, is one of great interest and deserves reprinting. A facsimile, somewhat reduced in size, is shown on the opposite page.

The facts which led to the printing of this broadside are, briefly, as follows. Dr. Benjamin Waterhouse received a copy of Jenner's book early in 1799 and published the first notice about it in a newspaper, March 12 of that year. On July 8, 1800, over a year later, he received some cowpox vaccine and vaccinated his five year old son—the first person to be so treated in America. The procedure, however, was not quickly adopted, many of the older physicians being against it and only a few of the younger practitioners carrying out this simple maneuver. Even in the summer of 1802, when there was an epidemic of smallpox in Boston, Waterhouse states: "The faculty in that town, with one exception, had not given it their decided approbation and countenance" and "the younger practitioners inoculated,* now and then, a few, but scarcely enough to keep up a continuity of cases, for the preservation of the matter" (p. 48).† Thus it will be seen that without the help of the physicians of Boston and with the cowpox matter in danger of being lost on account of the infrequency of vaccination, Waterhouse was in no position personally to force the issue. Another factor, moreover, had appeared: persons outside of the medical profession were using cowpox vaccine and, as Waterhouse states: "Journeymen mechanics, apprentices, day labourers, and, in some instances, children inoculated each other." Thus a number of persons were unsuccessfully vaccinated or, in some instances, given secondary infections.

In order to overcome the situation, Waterhouse returned to the method which he had first used in acquainting the public with the value of vaccination. He published a letter in the *Columbian Centinel,* August 2, 1802, after previously reading the communication to the president of the Massachusetts Medical Society. In spite of this, the physicians of Boston would not accept vaccination, and finally Dr. Waterhouse made a direct appeal to the Board of Health in a long letter dated May 31, 1802. A brief history of vaccination was given, and Waterhouse asked for "a public experiment performed under your own inspection." Perhaps a little to Waterhouse's surprise, the Board of Health accepted at once, and the experiment was begun in August, 1802.

On August 16, nineteen boys, whose names and addresses are given in the broadside, were vaccinated with cowpox at the office of the Board of Health. On November 9 twelve of these boys, plus one boy who had been vaccinated two years before, were sent to Noddle's Island in Boston Harbor, where a temporary hospital had been set up, and were directly inoculated with fresh small-

*In 1802 the verb "to inoculate" was used for both cowpox and smallpox.

†*A Prospect of Exterminating the Small Pox,* Part II, etc. Cambridge, 1802.

pox matter. At the same time, two other boys were inoculated with the same material without having been previously vaccinated. Furthermore, on November 21 the thirteen boys who had been previously vaccinated and who had remained well, together with the other seven boys who had been vaccinated, were inoculated with "fresh matter," from the two unvaccinated boys, who had developed smallpox. The famous report of the ten physicians who, in addition to Benjamin Waterhouse, were invited to observe this experiment is printed in full in the broadside and ends with the italicized statement that the *"Cow-pox is a complete security against the Small-pox."* Thus a decisive experiment had been carried out, which should have fixed forever the practice of vaccination in Massachusetts. Unfortunately, the results of this splendid example of a group experiment relating to health are still ignored by some presumably intelligent individuals.

Great credit should go to the children who submitted to this procedure and to the ten physicians who assisted Waterhouse, but particular honor should be given to the twelve citizens who formed the Board of Health. These men, one from each ward, performed their duties without financial compensation. Their president, Isaiah Doane, has left a rich heritage behind him as the result of this experiment and of the fine way in which he carried out a controversial matter. The broadside, moreover, is of particular interest to the medical profession, for it gives a more extended account of the procedure than is found in the book by Waterhouse, and it lists five doctors who served on the committee who were not given due credit in this publication.

POLIOMYELITIS

NEWSPAPER reports of the trial of chemical nasal sprays for the prevention of poliomyelitis in certain cities in the Midwest, where the disease has been common this summer, have caused many parents to wish to have their children treated even in areas of low prevalence.

The application of this procedure in man is based on experiments in monkeys which have yielded good results in blockading the entrance of the virus placed on the nasal mucous membrane. But those[1] who have conducted these experiments, in recommending the trial of the procedure in man, strongly urge that it be in the nature of an investigation, "for it does not necessarily follow that the results which have been obtained in monkeys apply equally in man." Nevertheless, they feel that such a trial is justified because of the protection yielded in animal experiments by this relatively simple and apparently nontoxic agent. However, they urge that the first human application of the measure be carried out in epidemic areas where comparisons can be made by keeping careful records of the occurrence of the disease in both treated and untreated individuals. Although there is no good reason for believing that the solution used will produce any harmful effects, it is also urged that those who supervise the procedure be on the alert to guard against any possible side action or important harmful local or general effect.

It should be remembered that, at best, attempts to prevent poliomyelitis by such measures involve the application of the treatment to many normal individuals in the hope of thus preventing the spread of the disease among the as yet unpredictable, small minority who would otherwise be affected. Under the circumstances, it would seem that the general adoption of this procedure should await the results of the present investigation which is being carried out primarily in the hope that it will throw some light on the unsettled question as to whether this chemical nasal spray actually is applicable in man for the prevention of poliomyelitis.

REFERENCE

1. Schultz, E. W., and Gebhardt, L. P.: Zinc sulfate prophylaxis in poliomyelitis. J. A. M. A. 108:2182 (June 26) 1937.

OBITUARY

DANIEL FISKE JONES, M.D., 1868-1937

THE life of the late Daniel Fiske Jones ought to be an inspiration and a challenge to younger men in the profession of surgery. His distinguished career illustrates what high ideals, hard work and honesty of purpose can accomplish. Born in Minneapolis in 1868, and educated in the public schools of that city, he was graduated at Harvard in 1892. He was endowed with physical strength and vigor, and was a member of the '92 class crew. His athletic training added to his natural strength of body, and gave him the constitution which made possible the physical endurance which is necessary to surgical success. In college he made a good record in scholarship and also graduated with high rank from the Harvard Medical School in 1896, after which he was appointed surgical house officer at the Massachusetts General Hospital. He became private assistant to

the late Maurice H. Richardson, at that time prominent in surgery in New England and one of the leading surgeons of this country. He made the most of his opportunities and soon acquired an experience which was an important element in his success. He was early appointed surgeon to outpatients at the Massachusetts General Hospital, and continued his connection with that institution, as visiting surgeon and surgeon-in-chief until his retirement in 1928 (compulsory at the age of sixty years).

His skill and judgment, which were early recognized among the profession, resulted in the rapid acquirement of a large consulting practice. He was one of the chief supporters, for many years, of the New England Deaconess Hospital, was chief-of-staff at the Palmer Memorial Hospital, and gave without stint his valuable services to these institutions. He was consulting surgeon to the Newton Hospital and many smaller hospitals throughout New England.

His interest in surgery led him to undertake the more difficult cases, but his good judgment led him, in his consideration of these cases, never to forget the interests of his patient. He obtained the assignment of the difficult field of cancer of the large bowel at the Massachusetts General Hospital. This assignment he performed with such skill and success that a very great reduction in the mortality of these cases, both in the hospital and in private practice, resulted. Because of his careful study of the anatomy he made many important contributions to this difficult field. His end results were so carefully tabulated and followed up that there could be no question of their accuracy and, in consequence, they were accepted by the surgical world at their full value. By his studies he made the operation safe, the patients more comfortable and the results more lasting, not only in his own practice, but throughout the country. This work contributed largely to his reputation here and in Europe.

In 1915 he went to France as surgeon-in-chief of the British Base Hospital 22, where he gave devoted service for eight months, and, on his return, joined the U. S. Army Medical Corps as Lieutenant Colonel.

His talents and character gave him wide recognition among the leaders of his profession. He was a member of the Society of Clinical Surgeons, the Interurban Surgical Society, the New England Surgical Society, and the Boston Surgical Society and was given the high honor of the presidency of the American Surgical Association in 1933. He represented America at the meeting of the International Surgical Society at its meeting in Warsaw in 1929.

He was fond of all outdoor sports, and many of his well-earned vacations were spent in fishing expeditions to Canada, and quail hunting in the South, which he once said was his chief pleasure outside the practice of his profession.

He had been a valuable member of the Board of Overseers of Harvard University since 1932, and was for several years a regent of the American College of Surgeons. He taught in the Harvard Medical School for many years, and contributed freely of his advice and judgment to the faculty of that institution.

His professional ideals were of the highest, and to these his practice conformed. He had the devotion and love of his patients in a marked degree, and was trusted as a consultant by the members of his profession in large numbers. No one could fail to recognize his honesty, skill and devotion to the interests both of his profession and his patients. For the last two or three years his health had not been of the best, but his courage and patience in the endurance of his difficulties were memorable.

In July he accompanied the Society of Clinical Surgery on a trip to Scandinavia, but became very ill while in Sweden and had to spend much of his time in a hospital in Gütenborg. Undaunted, he rejoined the group in London, and came home with the party on the *Caledonia* from Glasgow. Those who were privileged to be of the party, will never forget the courage with which he bore his very serious troubles, and his gracious appreciation of any efforts made for his comfort. He was, in spite of all, an appreciative and cheerful companion. From the ship he was taken to the Massachusetts General Hospital, and ended his days in the institution to which he had contributed such devoted service.

At his funeral service in Trinity Church so many persons in all walks of life came to testify to their love and respect for his memory that the church was filled to its capacity.

He left a reputation of which his family and friends are proud. He will be sincerely mourned by the leaders of his profession as well as by many, many patients in all walks of life.

What better memory could any surgeon leave behind him?

F. B. L.

MASSACHUSETTS MEDICAL SOCIETY

STATED MEETING OF THE COUNCIL

A stated meeting of the Council of the Massachusetts Medical Society will be held in John Ware Hall, Boston Medical Library, 8 Fenway,

Boston, on Wednesday, October 6, 1937 at 10:30 a. m.

Business:

1. Call to order at 10:30 a. m.
2. Presentation of record of last meeting. (Published in *New England Journal of Medicine,* issue of July 29, 1937.)
3. Report of Committee of Arrangements for the annual meeting.
4. Report of Committee on Membership and Finance.
5. Reports of other standing and special committees.
6. Reports of committees to consider petitions for restoration to the privileges of fellowship and appointment of new committees.
7. Appointment of an auditing committee.
8. Fill any vacancies in the offices of the Society.
9. Action on publication of the *Directory of Officers and Fellows.*
10. Incidental business.

Councilors are asked to sign one of the two attendance books before the meeting. The Cotting Luncheon will be served immediately after the meeting.

ALEXANDER S. BEGG, M.D.,
Secretary.

APPLICATIONS FOR MEMBERSHIP

At the annual meeting of the Council, held in Boston on June 2, 1937, a resolution was presented by Dr. Alexander A. Levi, secretary of the Middlesex South District Medical Society. This resolution had been considered upon a previous occasion and had been submitted to the Committee on Medical Education and Medical Diplomas for a report. The resolution as adopted is as follows:

> RESOLVED: That the names and addresses of applicants for membership in the Massachusetts Medical Society and the name and address of the secretary of the district be published together in a special list in the *New England Journal of Medicine* at least two weeks prior to each censors' meeting.

In order to carry out the provisions of the resolution, it will be necessary to have all applications in the hands of the district secretaries at least four weeks before the date of a given examination by the censors and, in the case of applicants holding diplomas from schools or colleges not upon the list approved by the Council, the application must be made at least eight weeks before the examination. If these provisions are not carried out, it will be impossible to publish the lists as required.

ALEXANDER S. BEGG, M.D.,
Secretary.

WEEKLY BROADCASTS ON PUBLIC HEALTH

THE Committee on Public Health and the Subcommittee on Public Education of the Massachusetts Medical Society announce the broadcasting of weekly health talks sponsored by the Society and the Massachusetts State Department of Public Health through Station WAAB, Wednesday evenings from 7:30 to 7:45, beginning on October 6. These will be publicized under the caption, "Green Lights to Health." The Committee is very anxious to have the reaction of the fellows of the Society to these broadcasts, which will be delivered in a slightly different fashion from heretofore. The program is more or less in the nature of an experiment and the Committee is eager for comments. The Committee will appreciate it very much if the fellows of the Society will make a special effort to listen to these broadcasts and hope that at this new time they will find it more convenient to do so. Letters concerning the broadcasts, with either favorable or unfavorable reactions, should be sent to Dr. Gerald N. Hoeffel, *Secretary,* 319 Longwood Avenue, Boston. The first six broadcasts will be the following:

On October 6, the broadcast will be on the subject of arthritis, under the title of "The Disease That Kills the Fewest and Cripples the Most," delivered by Dr. Walter Bauer.

On October 13, prenatal obstetrical care will be considered under the title of "The Dangers of Childbirth," delivered by Dr. Raymond S. Titus, to be followed on October 20 by postnatal obstetrical care under the title of "Childbirth Made Safe," delivered by Dr. John Rock.

On October 27, a broadcast on deafness under the title of "How Can You Hear What You Want To?" will be delivered by Dr. Francis L. Weille.

On November 3, a talk on appendicitis under the title of "Appendicitis — A Dangerous Stomachache," will be given by Dr. Irving J. Walker.

On November 10, the subject of obesity and indigestion, under the title of "What Price Fat?" will be considered by Dr. Franklin W. White.

Further series of broadcasts will be announced in the *Journal.*

SECTION OF OBSTETRICS AND GYNECOLOGY

M. Fletcher Eades, M.D., *Secretary*,
19 Bay State Road,
Boston

Case History No. 38. Hyperemesis Followed By Severe Polyneuritis. Miscarriage at Six and One-Half Months

Mrs. C. M., a twenty-six-year-old white gravida 1, was admitted to the hospital May 9, 1937, in the twenty-sixth week of gestation, complaining of abdominal cramps, vaginal bleeding and pain in all extremities.

Her pregnancy was characterized by early and persistent vomiting, beginning in the third week, and requiring hospitalization on four occasions prior to the fourth month. The vomiting was controlled and her general condition improved during each period of treatment, but relapses promptly occurred, and the result, as a whole, was a gradual impairment of health. In the fifth month she began to have severe pains in the arms and legs. Shortly after this she began to bleed per vaginam, and was again referred to the hospital. The treatment consisted of measures to stop the abortion, namely, morphine, a high vitamin diet, with particular attention to vitamin B, calcium lactate, liver extract and iron, and local measures to combat the pain in her arms and legs. During her hospital course she acquired Vincent's angina which responded well to treatment. She was discharged on the nineteenth day as improved.

The medical history included measles and diphtheria in childhood. Four years ago she had an appendectomy followed by lobar pneumonia. The menses began at fifteen years of age. They were always regular. The cycle was twenty-eight days and the duration four days without pain. The last period began October 15, 1936.

There was no family history of malignancy, tuberculosis, chronic nephritis, diabetes or hemorrhagic disease.

The present illness began one hour previous to her admission by ambulance. The cramps were severe and occurred every five minutes, with a moderate amount of flow.

Physical examination revealed a poorly nourished, anemic female, complaining bitterly of abdominal pain, and pain in the arms and legs. The temperature was 98.8° F., the pulse 94, and the respirations 22. The teeth were carious. The oral hygiene was poor, and the tongue thickly coated. The thyroid was not enlarged. The lungs were clear to percussion and auscultation. The size of the heart was normal, the sounds were regular, clear, and no murmurs were heard. The blood pressure was 130 systolic and 80 diastolic. A right pararectal scar was present. There was a soft mass in the midline below the umbilicus corresponding to a five months' pregnancy. The extremities were extremely tender. The patient could be made to cry out with pain by mere palpation. The urinalysis showed a trace of sugar and albumin, and, on microscopic examination, bacteria and one to five white cells per high power field were present.

The patient was observed for one hour during which the cramps became stronger and more frequent, although the bleeding remained about the same. At the end of this time she passed a macerated fetus weighing one pound. The secundines remained in utero, but, as the bleeding was minimal, an expectant plan of further treatment was instituted. The patient was given pitocin and morphine and returned to her room. Three hours later she passed the placenta and membranes, apparently complete. Oxytocics were administered and a high vitamin, high caloric diet, with calcium, iron and liver extracts, was given. The patient was unable to move her hands or feet at first, but improvement was gradual and at the end of one week she could use her hands and had very little spontaneous pain in the extremities. Any movement of the legs, however, was painful.

A neurological consultation was obtained. The diagnosis of the neurologist was peripheral neuritis on a vitamin deficiency basis, probably as a result of excessive vomiting and consequent insufficient vitamin intake in early pregnancy.

The postabortal period was afebrile, involution proceeded satisfactorily, and the patient was discharged, as improved, on the twelfth day after admission.

A check-up of the patient two months after discharge showed that she had recovered in all respects except in the use of her legs. She was still unable to walk without the aid of crutches. Physiotherapeutic treatments, massage, hydrotherapy and electrotherapy are producing a slow but gradual improvement.

Comment. Vitamin deficiency may play a very important part in the pathology of pregnancy. Many cases of vomiting early in pregnancy are improved by the administration of vitamin B in the form of brewers' yeast or capsules containing vitamin B. Extreme cases of nausea in the early months of pregnancy are vastly improved by a diet rich in this vitamin. Polyneuritis in pregnancy is uncommon and must be looked upon as an extreme

A series of selected case histories by members of the section will be published weekly.

Comments and questions by subscribers are solicited and will be discussed by members of the section.

case of vitamin deficiency. Whether the miscarriage was induced because of this vitamin deficiency is problematical but not at all unlikely.

The conservative handling of this miscarriage is worthy of mention. Everything was left to nature. No vaginal examination was made. The fetus was delivered spontaneously. No attempt was made to remove the placenta after the fetus was delivered, and this, too, came away spontaneously. Conservative treatment pays.

RECENT DEATHS

DERBY — Frederick W. Derby, M.D., of Boston, died September 4 at the age of 62 years.

After attending the Arlington schools he graduated from Tufts College Medical School in 1906, later taking several postgraduate courses at the Harvard Medical School.

Dr. Derby was connected with many of the hospitals in Greater Boston, limiting his practice exclusively to ophthalmology, and for twelve years was director of ophthalmology of the White Health Units of the City of Boston.

He had contributed articles to many medical journals.

Among his fellowships were the Massachusetts Medical Society, the American Medical Association and the New England Ophthalmological Society.

His widow, Elizabeth (MacGuire) Derby, survives him.

DREW—Maria E. Drew, M.D., of 39 Newbury Avenue, North Quincy, died September 12. She was in her sixty-eighth year.

Born in Dorchester she was educated in the Quincy schools. In 1892 she graduated from Tufts College Medical School. Dr. Drew was appointed school physician in 1922, a position which she held until her retirement last December.

Her memberships included fellowships in the American Medical Association and the Massachusetts Medical Society. She was also a member of the Tufts College Medical School Association and on the staff of the Quincy City Hospital.

A sister, Mrs. Fred Rayner, and a brother, Arthur E. Drew, survive her.

MURPHY — Joseph Briggs Murphy, M.D., of 23 Summer Street, Taunton, died September 5, at his summer home at Falmouth Heights. He was in his seventy-eighth year.

His education included graduation from Collège Sainte Marie in Montreal and from Harvard Medical School in 1883. Appointment to the Boston City Hospital followed and, later, service at Saint Elizabeth's Hospital, Brighton, and the Carney Hospital, South Boston.

Dr. Murphy married Emily F. Bliss, who also became a physician. For more than fifty years both were in active practice in Taunton.

He was a fellow of the Massachusetts Medical Society and a member of the American Medical Association.

A son, Dr. Joseph L. Murphy, a daughter, Miss Maydell Murphy, and five grandsons survive him.

HOLLAND—Arthur G. Holland, M.D., died suddenly September 13, at his home, 12 Burwell Road, West Roxbury. He was in his fifty-seventh year.

Born in Manchester, New Hampshire, Dr. Holland was graduated from Dartmouth College in 1912.

For fifteen years he had been resident physician in charge of the East Boston Relief Station, later transferring to the Haymarket Relief Station. Several years ago he was appointed executive assistant to Dr. James W. Manary by the trustees of the Boston City Hospital.

His widow, a son, and three sisters survive him.

NOTICES

ANNOUNCEMENT

John Homans, M.D., announces his return to practice in Boston, with an office at the Peter Bent Brigham Hospital. Telephone Longwood 0583.

REMOVALS

M. H. Rovner, M.D., announces the removal of his office to 20 West Emerson Street, Melrose.

Wilfred Bloomberg, M.D., announces the removal of his office to 189 Bay State Road, Boston. Kenmore 3010.

Judson A. Smith, M.D., announces the removal of his office to 264 Beacon Street, Boston.

NEW ENGLAND SURGICAL SOCIETY

The annual meeting of the New England Surgical Society will be held in Providence, Rhode Island, October 1 and 2, with headquarters at the Providence Biltmore Hotel.

General Program

Friday, October 1

8 a. m. to 10 a. m. Operative clinic. Rhode Island Hospital

10 a. m. to 12 noon. Dry clinic. Rhode Island Hospital, Providence; and Memorial Hospital, Pawtucket

1 p. m. Luncheon—Rhode Island Hospital

2 p. m. Scientific program. Rhode Island Hospital

5 p. m. Squantum Club

Saturday, October 2

9 a. m. Annual meeting of the Society. Rhode Island Medical Library, Francis Street, Providence

9:30 a. m. to 12:30 p. m. Scientific program. Rhode Island Medical Library

Scientific Program

Rhode Island Hospital

Friday Afternoon, October 1

A series of atypical osteotomies for deformity. Frederic J. Cotton

Discussion: Ezra A. Jones and Frank R. Ober

Subperiosteal resection of the manubrium for funnel chest. Philemon E. Truesdale

Discussion: James W. Sever and Robert B. Osgood

Immediate surgery in acute cholecystitis. Joseph F. Lembright (by invitation)

Discussion: Howard M. Clute and Carl M. Robinson

Acute hemorrhagic pancreatitis. George Dunlop (by invitation

Discussion: Ernest L. Hunt and Irving Walker

The surgical treatment of abdominal fistulas. Samuel F. Marshall (by invitation)

Discussion: Frank H. Lahey and H. Gildersleeve Jarvis